SLV-7700KME/7700KML

RMT-V208

SERVICE MANUAL

ME Model
SLV-7700KME

E Model
SLV-7700KML

Photo : SLV-7700KME

COMPACT disc DIGITAL VIDEO

COMPACT disc DIGITAL AUDIO

Hi-Fi

H MECHANISM

• Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT Ⅳ (H MECHA) for MECHANICAL ADJUSTMENTS. (9-973-623-11)

SPECIFICATIONS

System

Colour system
PAL, MESECAM, NTSC 3.58, NTSC 4.43
TV system
B/G, D/K, I, M
Channel coverage
B/G: VHF E2 to E12/UHF E21 to E69/
CATV S01 to S05, S1 to S41
D/K: VHF R1 to R12, C1 to C12/
UHF R21 to R69, C13 to C57
I: VHF SA4 to SA13/UHF B21 to B69/
CATV S01 to S05, S1 to S41
M: VHF A2 to A13/UHF A14 to A69/
CATV A-8 to A-1, A to W, W+1 to W+84
RF output signal
UHF channels 21 to 69
Aerial out
75-ohm asymmetrical aerial socket

VCD part

Laser
Semiconductor laser
Wavelength
780 - 790 nm
Signal format system
NTSC, PAL
Frequency response
2 Hz to 20 kHz ±0.5 dB
Signal-to-noise ratio
More than 105 dB
Harmonic distortion
Less than 0.0022%

Inputs and outputs

LINE-1/2 IN
VIDEO IN, phono jack (1 each)
Input signal: 1 Vp-p, 75 ohms,
unbalanced, sync negative
AUDIO IN, phono jack (2 each)
Input level: 327 mVrms
Input impedance: more than 47 kilohms
LINE 1/2 OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms,
unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms
Video CD DIRECT OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms,
unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 2.0 Vrms max
Load impedance: 47 kilohms
Output impedance: less than 600 ohms

General

Power requirements
110 – 240 V AC, 50/60 Hz
Power consumption
36 W
Operating temperature
5°C to 40°C
Storage temperature
–20°C to 60°C
Dimensions
Approx. 430 x 119 x 384 mm (w/h/d)
including projecting parts and controls
Mass
Approx. 7.5 kg

Supplied accessories

Remote commander (1)
R6 (Size AA) batteries (2)
Aerial cable (1)
Mains lead (1)
Audio/video cable (3-phono to 3-phono) (1)
Microphone (1)
Plug adaptor (1)

Design and specifications are subject to change without notice.

VHS PAL NTSC

VIDEO CD PLAYER/ VIDEO CASSETTE RECORDER

MICROFILM

SONY®

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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SERVICE NOTE

VHS

1. REMOVAL OF DRUM ASSEMBLY (Fig.1.)

1) Remove the screw ① (P3×8)
2) Remove the shaft ground assembly ②.
3) Remove three screws ③ (P3×6).
4) Remove the drum assembly ④.

Note: When attaching the drum assembly, be careful not to blur the contacting surface with fingerprint or like.
When attaching the shaft ground assembly, be careful not apply force to the spring section of it.

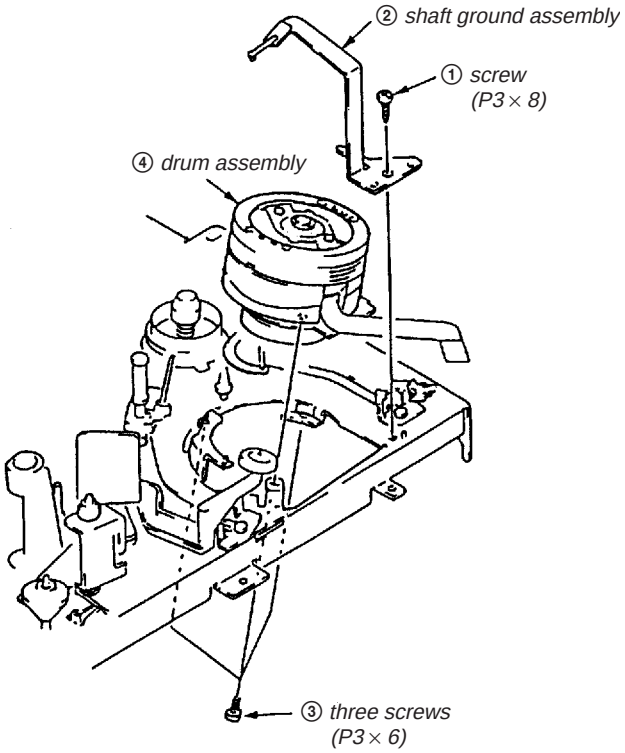


Fig. 1.

2. UPPER DRUM REPLACEMENT

2-1. Removal of Upper Drum (Fig. 2.)

1) Remove the screw ① (P3×8).
2) Remove the shaft ground assembly ②.
3) Completely remove the rotary upper drum board and desolder the soldering indicated by the arrows. (16 points)
4) Remove the screws ③ (PSW 3×8) and tape out the rotary upper drum assembly in the direction of arrow. (See Fig. 3.)
   If it is difficult, remove by shaking the rotary upper drum gradually.

   Note: If the drum can not be removed, check whether the solders have been removed or mot again.

2-2. Mounting Upper Drum

1) Mount the rotary upper drum assembly by aligning marked ➧ with marked ⇒ of rotary transformer board (lower drum) so that the screw holes of both upper and lower drums match.

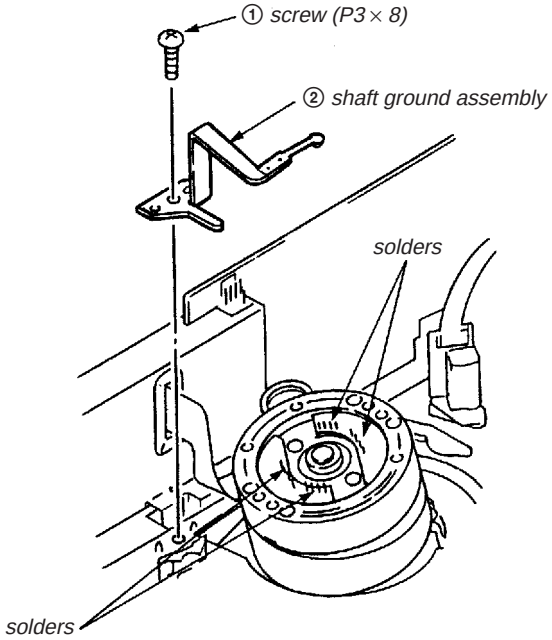


Fig. 2.

Note: When inserting the rotary upper drum assembly into the lower drum, be careful not to blur the contacting surface with fingerprint or like.

2) If it is difficult, mount the upper drum by shaking it gradually.

   Note: Be careful not to damage the head. Make sure that the upper drum is tightly inserted.
3) Tighten two screws ③ (PSW 3×8). (See Fig. 3.)

   Note: Temporary tighten two screws, After making sure that upper drum is tightly inserted, tighten the screws.

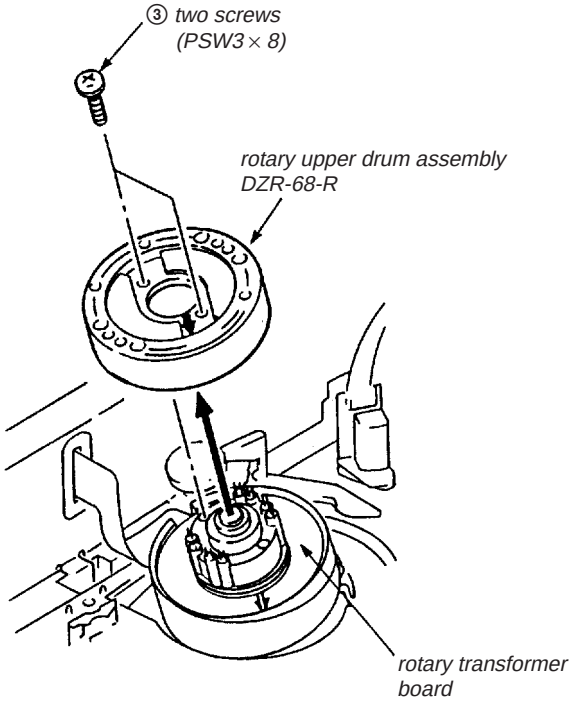


Fig. 3.

4) Solder 16 points on the rotary upper drum board. (See Fig. 2.)
5) Fix the shaft ground assembly ② using the screw ① (P3×8) so that the protrusion of the shaft ground assembly end contacts the center of the drum shaft, (See Fig. 2.)
   Note: When attaching the shaft ground assembly, be careful not to apply force to the spring section of it.
6) Tighten the screw ① (P3×8). (See Fig. 2.)

3. PERIODIC CHECK AND REPLACEMENT

(Refer to the VHS MECHANICAL ADJUSTMENT Ⅳ (H MECHA) MANUAL.)

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

- The following must be done after every repair regardless of how many hours the user has operated the machine.

3-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth which has been dipped in cleaning fluid lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

3-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

3-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that been dipped in cleaning fluid.

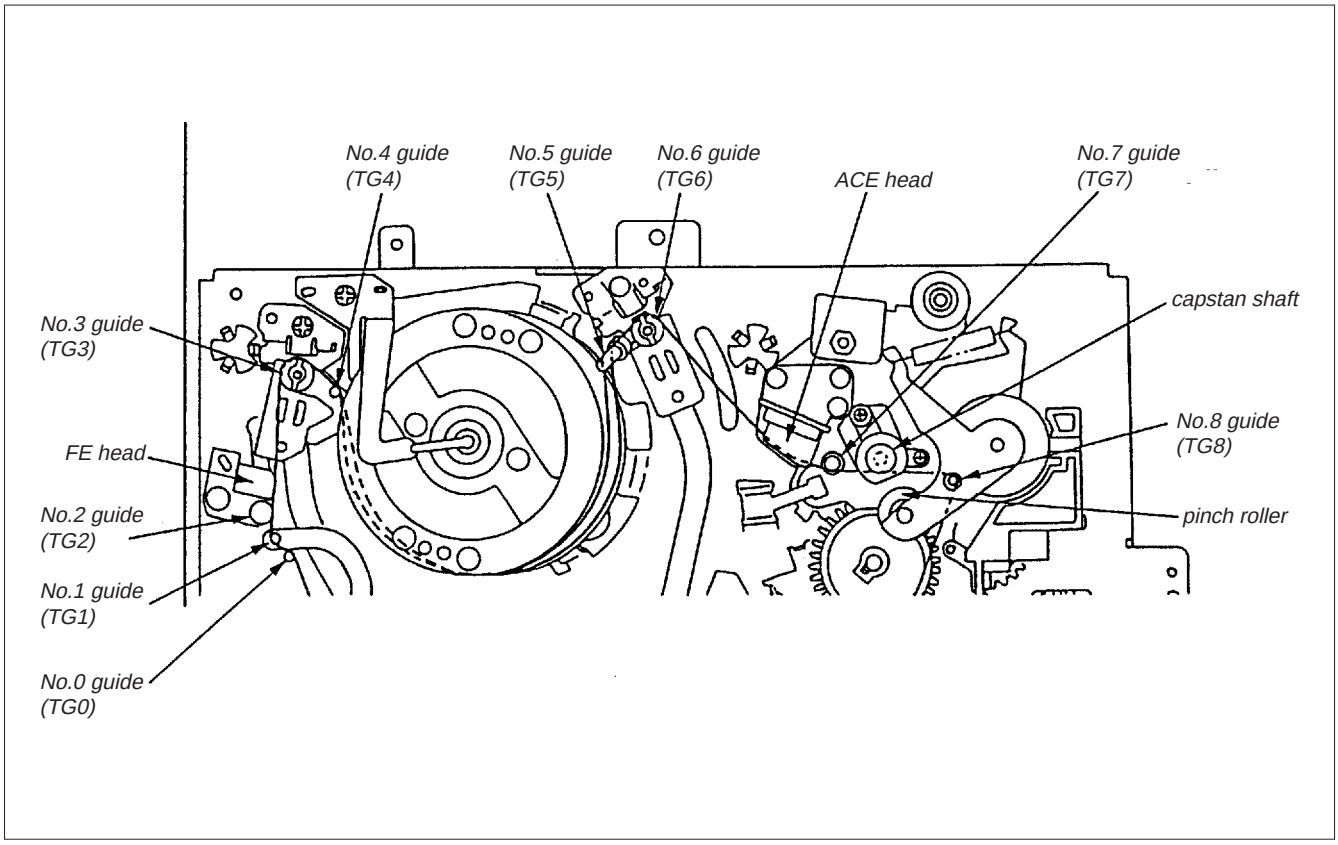
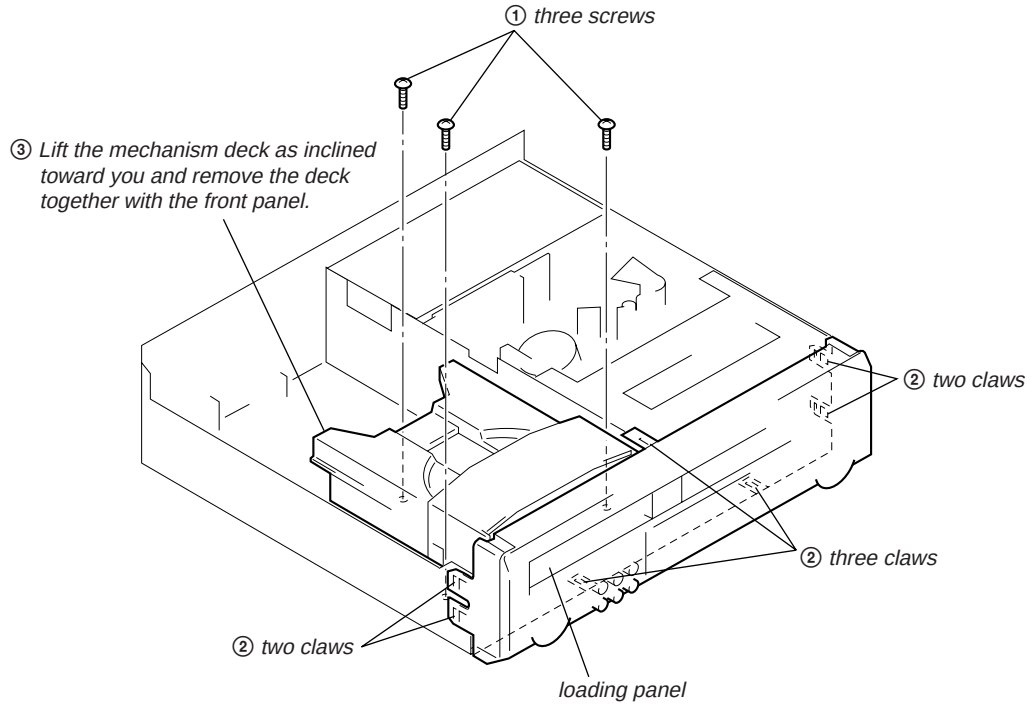


Fig. 4. Parts requiring cleaning

VIDEO-CD

1. REMOVING THE VIDEO-CD MECHANISM DECK (WHEN NOT ENERGIZED)

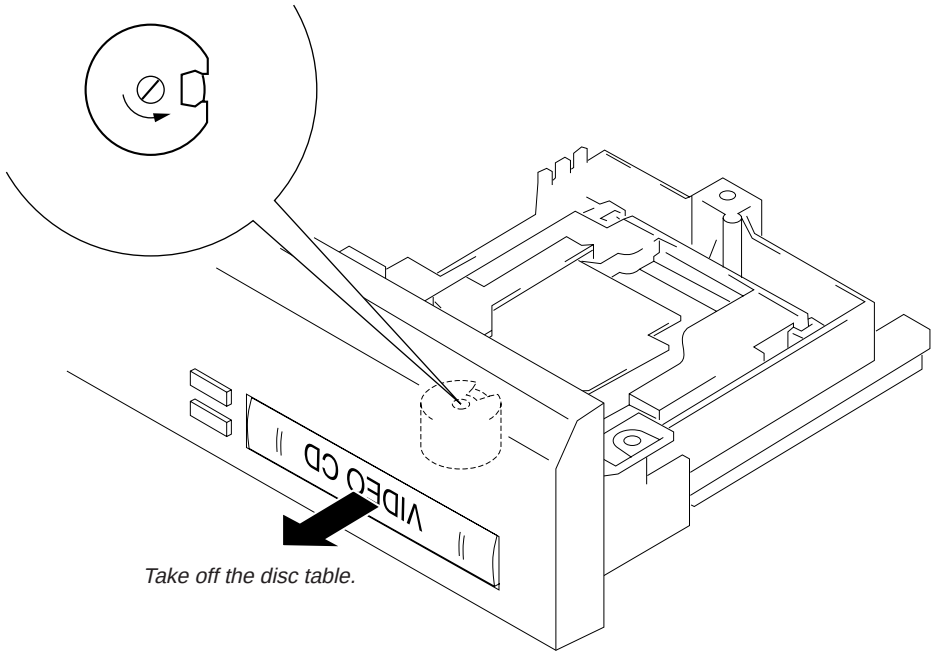
① Remove three screws securing the mechanism deck.
② Undo seven claws on the front panel to lift the front panel.


① three screws
③ Lift the mechanism deck as inclined toward you and remove the deck together with the front panel.
② two claws
② three claws
② two claws
loading panel

④ Remove harness of CDM-14 board and flat cable of BD-21 board.

2. REMOVING THE DISC (WHEN NOT ENERGIZED)

① *Turn the cam to the direction of arrow (counter clock wise) by tapering driver.*



② *Remove the loading panel from the disc table.*
③ *Remove the front panel from the mechanism deck.*

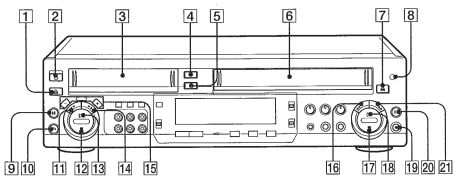
SECTION 1
GENERAL

This section is extracted from instruction manual.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

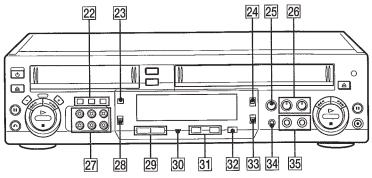
Front panel



1 VIDEO CD/Audio CD ⏏ OPEN/CLOSE button (36)
2 ON/STANDBY switch/indicator (8)
3 VIDEO CD/Audio CD compartment
4 OUTPUT SELECT VHS button (28)
5 OUTPUT SELECT VCD button (37)
6 Tape compartment
7 Video tape ⏏ EJECT button (27)
8 Remote sensor (5)
9 VIDEO CD/Audio CD ❚❚ PAUSE button (37)
10 VIDEO CD ↩ RETURN button (71)
11 VIDEO CD/Audio CD ⏮ PREV button (37)
12 VIDEO CD/Audio CD ■ STOP button (37)
13 VIDEO CD/Audio CD ▷ PLAY SELECT button (36)
14 VIDEO CD/Audio CD ▶▶| NEXT button (37)
15 MENU +/– buttons (71)
16 VHS ◀◀ REW/⏀ SEARCH button (27)
17 VHS ■ STOP button (27)
18 VHS ▷ PLAY button (26)
19 VHS ● REC button (31)
20 VHS ❚❚ PAUSE button (27)
21 VHS ▶▶ FF/⏀ SEARCH button (27)

continued

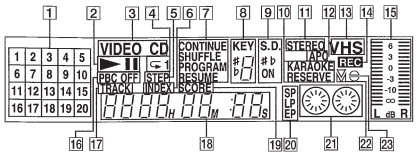
Index to parts and controls (continued)



22 INPUT SELECT (1/2/VCD) buttons (33, 50, 79)
23 TV input select/RF CHANNEL button (8)
24 KARAOKE MODE switch (75)
25 ECHO control (43)
26 MIC VOL 1/2 controls (43)
27 LINE-2 IN/OUT VIDEO AUDIO L/R jacks (49)
28 COLOR SYSTEM switch (27)
29 PROGRAM +/– buttons (9)
30 TIMER REC indicator (34)
31 KEY CONTROL ♭/♯ buttons (76)
32 KARAOKE (ON/OFF) button (43)
33 DIGITAL SOUND EFFECTOR switch (27, 37, 44)
34 CONTROL jack (42)
35 MIC IN 1/2 jacks (42)

Display window

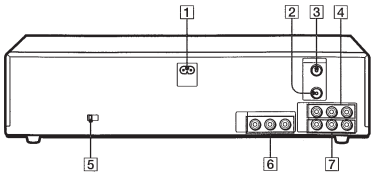
You can make the display window dim. Press MENU and select SET UP MENU, then set DIMMER to ON.



1 Music calendar (39)
2 CD operating indicator
3 CD/VIDEO CD indicator
4 Repeat indicator (64)
5 STEP indicator (67)
6 INDEX indicator (62)
7 CONTINUE/SHUFFLE/PROGRAM/RESUME indicator (60, 66, 67)
8 Key control indicators (76)
9 S.D. indicators (77)
10 KARAOKE RESERVE indicator (73)
11 STEREO indicator (51)
12 APC indicator (53)
13 VHS indicator
14 VHS REC indicator (31)
15 Audio channel/sound level indicator
16 PBC indicator (70)
17 TRACK indicator (39)
18 Time counter/programme position indicator (28, 67)
19 SCORE indicator (78)
20 Tape speed indicator (30, 32)
21 Tape indicator
22 Tracking indicator (53)
23 Audio dubbing indicator (55)

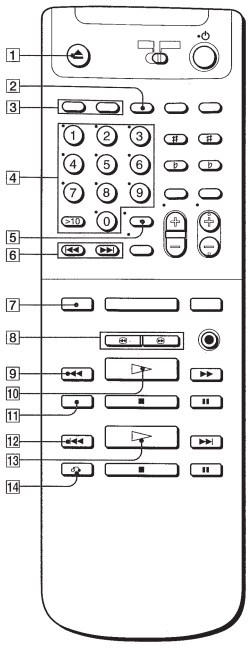
Index to parts and controls (continued)

Rear panel



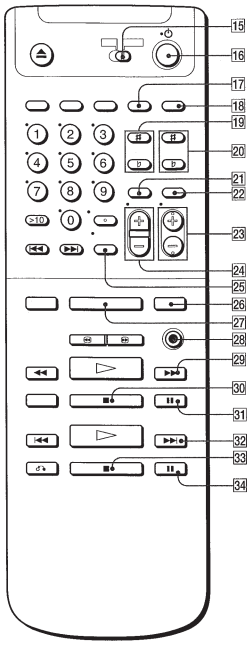
1 AC IN ∼ connector (6)
2 AERIAL OUT connector (6)
3 AERIAL IN connector (6)
4 LINE 1 OUT VIDEO/AUDIO R/L jacks (7)
5 NTSC PB switch (6, 10)
6 LINE-1 IN VIDEO/AUDIO R/L jacks (44)
7 Video CD DIRECT OUT VIDEO/AUDIO R/L jacks (7)

Remote commander



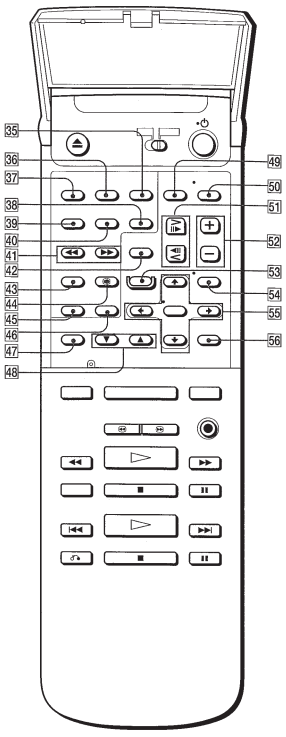
1 VHS ⏏ EJECT button (27)
2 VIDEO CD SCENE button (58)
3 TRINITRON TV SYNCHRO PLAY VHS/VCD buttons (29, 38)
4 Programme number/>10/ –/-- (ten's digit) buttons (58, 67, 70)
5 DISPLAY button (28, 40)
6 ⏮ / ⏭ INDEX SEARCH buttons (52)
7 OUTPUT SELECT VCD button (37)
8 VHS ⏪/⏩ SEARCH buttons (27)
9 VHS ◀◀ REW button (27)
10 VHS ▷ PLAY button (26)
11 VHS INPUT SELECT button (33, 50, 79)
12 VCD ⏮ PREV button (37)
13 VCD ▷ PLAY SELECT button (36)
14 VCD PBC RETURN button (71)

continued



15 TV/VCD/VHS remote control switch (5)
16 ⏻ (on/standby) switch (34)
17 VIDEO CD INDEX button (62)
18 SCORE button (78)
19 SELF DUET #/♭ buttons (77)
20 KEY CONTROL #/♭ buttons (76)
21 RESERVE button (73)
22 EXECUTE button (73)
23 PROG +/– buttons (30)
24 VOL +/– buttons (*for TV*)
25 TV/VIDEO button (*for TV*)
26 OUTPUT SELECT VHS button (28)
27 KARAOKE button (45)
28 VHS ● REC button (31)
29 VHS ▶▶ FF button (27)
30 VHS ■ STOP button (27)
31 VHS ❚❚ PAUSE button (27)
32 VCD ⏭ NEXT button (37)
33 VCD ■ STOP button (37)
34 VCD ❚❚ PAUSE button (37)

Remote commander (in the lid)



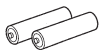
35 CHECK button (69)
36 CLEAR button (69)
37 PROGRAM button (67)
38 SHUFFLE button (66)
39 CONTINUE button (66)
40 REPEAT button (64)
41 ◀◀/▶▶ SEARCH buttons (37)
42 TAPE SPEED button (30)
43 SLOW button (61)
44 ⏩ LOCKED SEARCH buttons (37)
45 PBC ON/OFF button (71)
46 TIME button (39)
47 TRACKING AUTO/MAN button (53)
48 ▼/▲ TRACKING NORMAL/ SLOW/STILL ADJUST buttons (53)
49 ×2 button (46)
50 AUDIO MONITOR button (51)
51 ◀II/II▶ FRAME/</> buttons (46)
52 SLOW SPEED +/– buttons (46)
53 AUDIO DUB button (55)
54 MENU button (11, 54)
55 CURSOR ↑/↓/←/→ buttons (11, 54)
EXE button (11, 54)
56 COUNTER RESET button (28)

Step 1
Unpacking

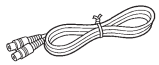
Check that you have received the following items with this unit.

- Remote commander

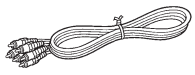
- R6 (Size AA) batteries



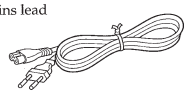
- Aerial cable



- Audio/video cable (3-phono to 3-phono)

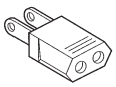


- Mains lead



- Microphone

- Plug adaptor



Checking your model name

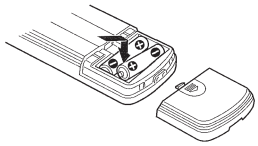
The instructions in this manual are for the 2 models : SLV-7700K ML, 7700K ME. Check your model number by looking at the rear panel of your unit.

Step 2

Setting up the remote commander

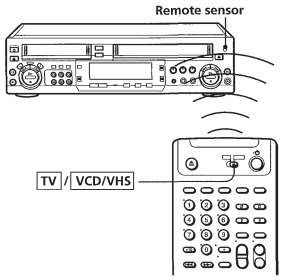
Inserting the batteries

Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.



Using the remote commander

You can use this remote commander to operate this unit and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



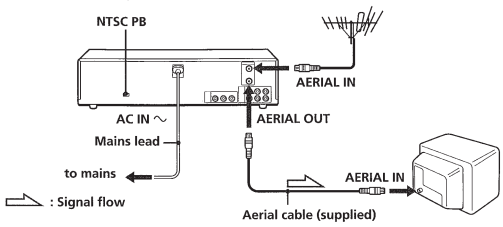
To operate	Set TV/VCD/VHS to
VCD/VHS	VCD/VHS and point at the remote sensor on this unit
a Sony TV	TV and point at the remote sensor on the TV

Notes

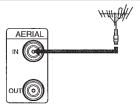
- The TV/VIDEO button selects an input source of the TV from aerial in or line in. The button does not control this unit.
- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Step 3

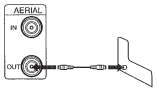
Connecting the unit



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of this unit.



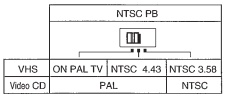
2 Connect AERIAL OUT of this unit and the aerial input of your TV using the supplied aerial cable.



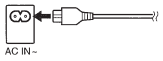
3 Set the NTSC PB switch to match your TV colour system.

If your TV is PAL system, keep the switch at the factory preset position (ON PAL TV) or set to NTSC 4.43.

If your TV is NTSC system, set to NTSC 3.58.



4 Connect AC IN ~ of the unit to the mains using the supplied mains lead.

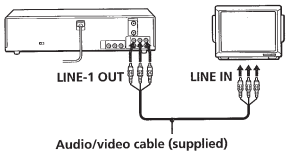


Additional connections

To a TV that has audio/video input jacks

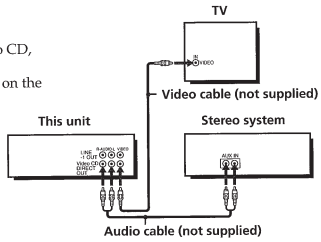
This additional connection improves picture and sound quality. Connect the TV as shown on the right.

If you want to use the Trinitron TV Synchro Play function (see pages 29, 38), this connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)



To a stereo system

When you enjoy a VCD and an audio CD, you can improve sound quality by connecting a stereo system as shown on the right.

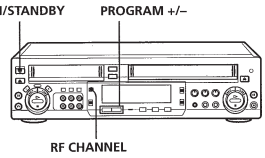


Step 4

Tuning your TV to this unit

If you have connected this unit to your TV using only the supplied RF cable, you must tune your TV to this unit so that your TV can receive the video signal through the RF channel. First try with the factory-preset RF 32 channel and do up to step 7 to complete the tuning. If the picture is unclear, try other channels by repeating from step 2.

If you have connected this unit to your TV using the audio/video cable, skip this procedure.



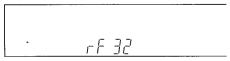
1 ON/STANDBY

Press ON/STANDBY to turn on this unit.

2 TV RF CHANNEL

Hold RF CHANNEL down for more than three seconds.

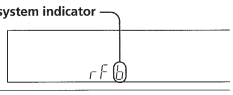
The factory-preset RF channel appears in the display window.



3 TV RF CHANNEL

Press RF CHANNEL.

The TV system indicator appears in the display window.



4 Turn on your TV and select a programme position for video playback.

Choose a programme position where there is no channel assigned.

This programme position will now be referred to as the video channel.

5

Tune the TV to channel 32 or a compatible channel referring to the tables on pages 16 to 23 so that the picture on the right appears on the TV screen. (Example: For China, 24 corresponds to RF32 shown in the column of "Channel number in the CHANNEL SET field" on page 21.)

Refer to your TV manual for tuning instructions.

6

PROGRAM − +

Press PROGRAM +/– to select the correct TV system.

If the picture in step 5 is clear, the TV system is correct.

If you cannot obtain clear picture with any TV system, do step 7 first and then see "To obtain a clear picture" below.

If your TV's colour system and TV system are		Select
PAL	B/G	*b*
	D/K	*d*
	I	*i*
NTSC	M	*m*

7

TV
RF CHANNEL

Press RF CHANNEL.

You have now tuned your TV to this unit.

To check to see if the TV tuning is correct

Set the TV to the video channel and press PROGRAM +/– on this unit. If the TV screen changes to a different programme each time you press PROGRAM +/–, the TV tuning is correct.

To obtain a clear picture

If the picture does not become clear in step 6 above, go to step 7 to finish this procedure once. Then start from step 2. After releasing RF CHANNEL in step 2 to display the RF channel, press PROGRAM +/– so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

Step 4: Tuning your TV to this unit (continued)

Notes

- If you play a VCD whose colour system is different from the NTSC PB (Video CD) position you selected, the size of the picture may not be correct.
- After you changed the NTSC PB (Video CD) position of this switch, turn off the power once, then turn it on again.
- If the picture is discoloured when the NTSC PB switch is set to ON PAL TV/PAL, set it to NTSC 4.43/PAL.
- If you set a wrong TV system, you may have no sound or noisy sound.
- The display on step 5 and the menu display appear black and white if:
  - the video signal is in the NTSC system
  - there is no video signal when the NTSC PB switch is set to NTSC 3.58

Step 5

Presenting channels

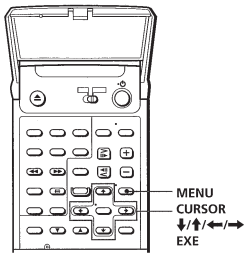
You can preset the receivable channels in your area automatically using the menu. If some channels could not be preset automatically, set them manually; if there are any unwanted channels among the preset ones, you can disable the channels.

If you live in the area where various TV systems coexist, and have channels that don't match the TV system you selected in automatic presetting, reset the TV system for those channels (see "Presetting channels manually" on page 13). If the channels don't match the TV system, the sound may be distorted or noisy, or the colour TV programme may become black and white, etc.

Presetting all receivable channels automatically

Before you start...

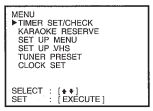
- Turn on the unit and the TV.
- Set the TV to the video channel.



1

•MENU

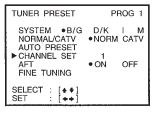
Press MENU.



2

EXE

Press CURSOR ↑/↓ to move the cursor (▶) to TUNER PRESET and press EXE.



continued

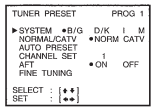
Step 5: Presetting channels (continued)

3

EXE

Press CURSOR ↑/↓/←/→ to move the cursor (▶) to SYSTEM, then select B/G, D/K, I or M, whichever is applicable in your area.

If SYSTEM is set to the wrong position, the sound will be distorted or noisy.

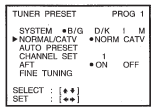


4

EXE

Press CURSOR ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then select NORM.

To preset CATV channels, select CATV.

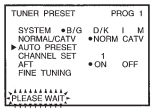


5

EXE

Press CURSOR ↑/↓ to move the cursor (▶) to AUTO PRESET, then press EXE.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.



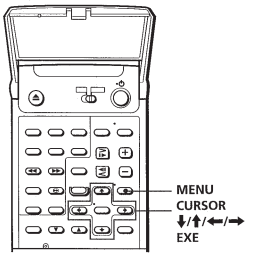
Notes

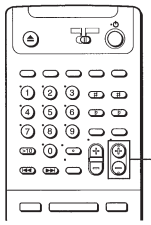
- The channel numbers beside CHANNEL SET may not be the same as those in your area. This is because this unit's channel search system is based on the fixed TV system that has the widest channel coverage.
- If the received channel is on cable TV, "C" appears on the left of the channel in step 5 in most areas. However, this won't be applied in some areas (see pages 16 to 23 for reference).

To check to see if the channels are preset correctly

Set the TV to the video channel and press PROGRAM +/– on the unit. If the TV screen changes to a different programme each time you press PROGRAM +/–, the channels are preset correctly.

Presetting channels manually

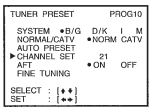




Getting Started

1 •MENU

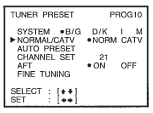
Press MENU, then press CURSOR ↑/↓ to move the cursor (▶) to TUNER PRESET and press EXE.



2

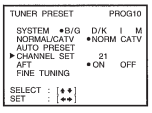
Press CURSOR ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then select NORM.

To preset CATV channels, select CATV.



3

Press CURSOR ↑/↓ to move the cursor (▶) to CHANNEL SET.

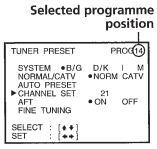


continued

Step 5: Presetting channels (continued)

4 •PROG

Press PROG +/– to select the programme position.



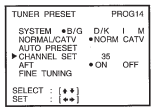
5

Press CURSOR ➡ repeatedly until the channel you want is displayed.

Pressing CURSOR ⬅ goes back to the previous channel.

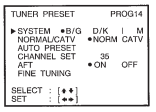
The channels are scanned in the order shown on pages 16 to 23.

If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5."



6

If the TV sound is distorted or noisy, press CURSOR ↑/↓/⬅/➡ to move the cursor (▶) to SYSTEM, then select B/G, D/K, I or M whichever is applicable in your area.



7

To allocate another channel to another programme position, repeat steps 4 and 5.

8

Press EXE.

Disabling unwanted programme positions

After tuning the TV channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons.

1 In step 5 on page 14, press programme number button "0" twice to display the number "0" beside CHANNEL SET.

2 Press EXE.

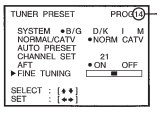
If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– to select the programme number for which you cannot obtain a clear picture.

2 Press MENU, then select TUNER PRESET and press EXE.

3 Select FINE TUNING. The fine tuning meter appears.



Selected programme position

4 Press CURSOR ⬅/➡ to get a clearer picture, then press EXE.

Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Notes

- The menu disappears automatically if you don't proceed for more than a few minutes.
- The channel numbers beside CHANNEL SET may not be the same as those in your area. This is because this unit's channel search system is based on the fixed TV system that has the widest channel coverage. If necessary, apply your local channel numbers to the programme positions (see pages 16 to 23).

continued

Step 5: Presetting channels (continued)

Channel numbers in the CHANNEL SET field and the corresponding channels

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET field	Corresponding channels				
1		AS0	1		1A
2	E2				
3	E3	1	2		2A
4	E4	2	3		3A
5	E5	6	4		4A
6	E6	7	5	M6	5A
7	E7	8	6	M7	6A
8	E8	9	7	M8	7A
9	E9	9A	8	M9	8A
10	E10	10	9	M10	9A
11	E11	11	10		10A
12	E12		11		11A
13					
14					
15		3			
16		4			
17					
18					
19					
20					
21	E21				
22	E22				
23	E23				
24	E24				
25	E25				
26	E26				
27	E27				
28	E28	28			
29	E29	29			
30	E30	30			

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET field	Corresponding channels				
31	E31	31, 32			
32	E32	33			
33	E33	34			
34	E34	35			
35	E35	36			
36	E36	37			
37	E37	38			
38	E38	39, 40			
39	E39	41			
40	E40	42			
41	E41	43			
42	E42	44			
43	E43	45			
44	E44	46			
45	E45	47, 48			
46	E46	49			
47	E47	50			
48	E48	51			
49	E49	52			
50	E50	53			
51	E51	54			
52	E52	55, 56			
53	E53	57			
54	E54	58			
55	E55	59			
56	E56	60			
57	E57	61			
58	E58	62			
59	E59	63, 64			
60	E60	65			
61	E61	66			
62	E62	67			
63	E63	68			

continued

Step 5: Presetting channels (continued)

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET field	Corresponding channels				
64	E64	69			
65	E65				
66	E66				
67	E67				
68	E68				
69	E69				
70					
C1	S1	5			
C2	S2				
C3	S3				
C4	S4				
C5	S5				
C6	S6	5A			
C7	S7				
C8	S8				
C9	S9			M4	
C10	S10			M5	
C11	S11				
C12	S12				
C13	S13				
C14	S14				
C15	S15				
C16	S16				
C17	S17				
C18	S18				
C19	S19				
C20	S20				
C21	S21				
C22	S22				
C23	S23				
C24	S24				
C25	S25				

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET field	Corresponding channels				
C26	S26				
C27	S27				
C28	S28				
C29	S29				
C30	S30				
C31	S31				
C32	S32				
C33	S33				
C34	S34				
C35	S35				
C36	S36				
C37	S37				
C38	S38				
C39	S39				
C40	S40				
C41	S41				
C42	S01				
C43	S02				
C44	S03				
C45	S04				
C46	S05				

continued

Step 5: Presetting channels (continued)

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET field	Corresponding channels						
1				A			
2	R1	1					
3		2		B		2, C2	
4		3		C		3	
5	R6	7		D	4	7	J-5
6	R7	8		E	5	8	J-6
7						9	J-7
8							
9						12	J-10
10						13	J-11
11						J	J-12
12	R12			J	10	K	S1
13	R2						
14	R3	4				5	
15	R4	5					
16	R5						
17	R8	9		F	6	10	J-8
18	R9	10		G	7	11	J-9
19	R10	11		H	8		
20	R11	12		I	9		
21	R21	13	B21		21	14, W+29, W+30	J13
22	R22	14	B22		22	15, 16, W+31	J14, J15
23	R23	15	B23		23	17, W+32	J16
24	R24	16	B24		24	18, W+33, W+34	J17
25	R25	17	B25		25	19, 20, W+35	J18, J19
26	R26	18	B26		26	21, W+36	J20
27	R27	19	B27		27	22, W+37, W+38	J21
28	R28	20	B28		28	23, 24, W+39	J22, J23
29	R29	21	B29		29	25, W+40	J24
30	R30	22	B30		30	26, W+41, W+42	J25
31	R31	23	B31		31	27, 28, W+43	J26, J27

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET field	Corresponding channels						
32	R32	24	B32		32	29, W+44	J28
33	R33		B33		33	30, W+45, W+46	J29
34	R34		B34		34	31, 32, W+47	J30, J31
35	R35		B35		35	33, W+48	J32
36	R36		B36		36	34, W+49, W+50	J33
37	R37		B37		37	35, 36, W+51	J34, J35
38	R38	25	B38		38	37, W+52	J36
39	R39	26	B39		39	38, W+53, W+54	J37
40	R40	27	B40		40	39, 40, W+55	J38, J39
41	R41	28	B41		41	41, W+56	J40
42	R42	29	B42		42	42, W+57, W+58	J41
43	R43	30	B43		43	43, 44	J42, J43
44	R44	31	B44		44	45	J44
45	R45	32	B45		45	46	J45
46	R46	33	B46		46	47, 48	J46, J47
47	R47	34	B47		47	49	J48
48	R48	35	B48		48	50	J49
49	R49	36	B49		49	51, 52	J50, J51
50	R50	37	B50		50	53	J52
51	R51	38	B51		51	54	J53
52	R52	39	B52		52	55, 56	J54, J55
53	R53	40	B53		53	57	J56
54	R54	41	B54		54	58	J57
55	R55	42	B55		55	59, 60	J58, J59
56	R56	43	B56		56	61	J60
57	R57	44	B57		57	62	J61
58	R58	45	B58		58	63, 64	J62
59	R59	46	B59		59	65	
60	R60	47	B60		60	66	
61		48	B61		61	67, 68	
62		49	B62		62	69	

continued

Step 5: Presetting channels (continued)

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET field	Corresponding channels						
63		50	B63		63	70	
64		51	B64		64	71, 72	
65		52	B65		65	73	
66		53	B66		66	74	
67		54	B67		67	75, 76	
68		55	B68		68	77	
69		56	B69		69	78	
70		57				79	
C1						A-3	J-3
C2						A-2, A-1	M1, M2
C3						A	M3
C4						B	M4
C5						C	M5
C6						D	M6
C7						E	M7
C8						F, G	M8, M9
C9						H	M10
C10		6				I	J-4
C11					11	L	S2
C12					(12)	M, N	S3
C13					13	O	S4
C14						P	S5, S6
C15						Q	S7
C16						R	S8
C17						S	S9
C18						T, U	S10, S11
C19						V	S12
C20						W	S13
C21						W+1, W+2	S14, S15
C22						W+3	S16
C23						W+4	S17

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET field	Corresponding channels						
C24						W+5, W+6	S18, S19
C25						W+7	S20
C26						W+8	S21
C27						W+9, W+10	S22, S23
C28						W+11	S24
C29						W+12	S25
C30						W+13, W+14	S26, S27
C31						W+15	S28
C32						W+16	S29
C33						W+17, W+18	S30, S31
C34						W+19	S32
C35						W+20	S33
C36						W+21, W+22	S34, S35
C37						W+23	S36
C38						W+24	S37
C39						W+25, W+26	S38, S39
C40						W+27	S40
C41						W+28	S41
C42						4, 4A	
C43							
C44						6	
C45						A-5	J-1
C46						A-4	J-2

Tip

- The shadow in the table shows the adjustable RF output channel range (see page 8 for reference).

Note

- There may be a case that the same area channel may appear repeatedly as the other channel number in the CHANNEL SET field.

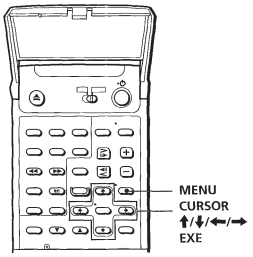
Step 6

Setting the clock

You must set the time and date on the unit to use the timer recording features.

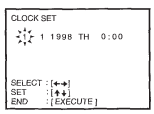
Before you start...

- Turn on the unit and the TV.
- Set the TV to the video channel.



1 •MENU

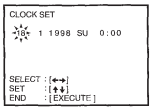
Press MENU, then press CURSOR ↑/↓ to move the cursor (▶) to CLOCK SET and press EXE.



2

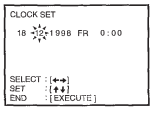
Press CURSOR ↑/↓ to set the date.

The day of the week is set automatically.

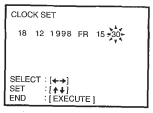


3

Press CURSOR → to flash the month and set the month using CURSOR ↑/↓.



4 Set the year, hour and minutes in sequence, using CURSOR ➡ to flash the item to be set, and CURSOR ⬆/⬇ to select the digits.



5 Press EXE to start the clock.

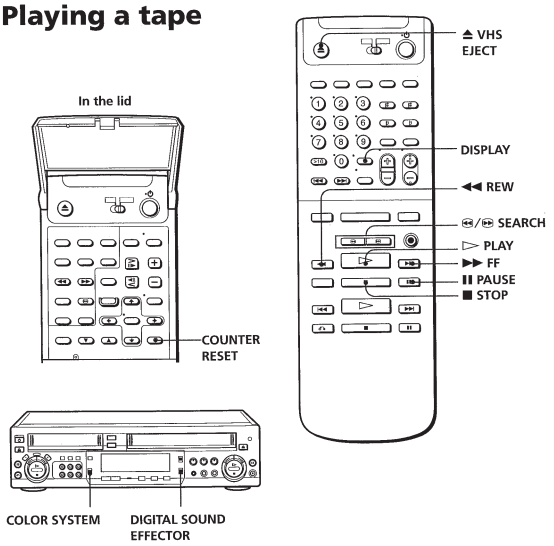
Tip

- To change the digits during setting, press CURSOR ⬅ to return to the item to be changed, and select the digits using CURSOR ⬆/⬇.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

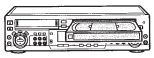
Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VHS part turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 PLAY ▷

Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ▷ PLAY
Search forward	▶▶ FF or ⏭ SEARCH during playback
Search backward	◀◀ REW or ⏮ SEARCH during playback
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

To set the colour system

If streaks appear during playback, set COLOR SYSTEM on this unit to conform to the system that the tape was recorded in. (Normally set the switch to AUTO.)

If your tape was recorded in	Set COLOR SYSTEM to
PAL	PAL/MESECAM
NTSC	NTSC
MESECAM	PAL/MESECAM

Sound effect

You can use the surround sound effect. To activate the surround function, set the DIGITAL SOUND EFFECTOR switch to SURROUND.

To give a monaural source the effect of a stereo sound, set the DIGITAL SOUND EFFECTOR switch to MONO EXPANDER. The MONO EXPANDER function also works for monaural sound from LINE INPUT.

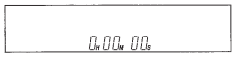
To cancel the surround sound effect

Set the DIGITAL SOUND EFFECTOR switch to OFF.

Playing a tape (continued)

To use the time counter

At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0H00M00S." Search for the point afterwards by referring to the counter.

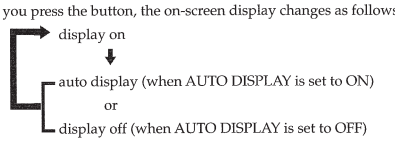


Using the on-screen display

You can check the operating status of the unit and the information about the tape with the on-screen display on the TV screen.

Press DISPLAY.

Each time you press the button, the on-screen display changes as follows:



When AUTO DISPLAY is set to OFF under SET UP MENU in the menu system, the on-screen display changes between on and off each time you press DISPLAY.

Tip

- To change the output signal to LINE OUT to the VHS signal manually, press OUTPUT SELECT VHS.

Notes

- The counter resets to "0H00M00S" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two video systems.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - the picture is black and white
  - the picture shakes
  - no picture appears on the TV screen
  - black streaks appear horizontally on the TV screen
  - the colour density increases or decreases.
- When the KARAOKE (ON/OFF) switch is set to on, this unit displays the karaoke information (page 45).
- You need to press OUTPUT SELECT VHS button to select the VHS part before playing when OUTPUT SEL is set to NORMAL under SET UP MENU in the menu system.

Turning on this unit and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

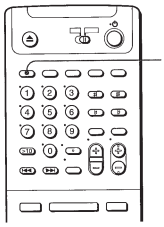
Connect this unit and TV with the audio/video cable (see "Connecting the unit" on page 6.) Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at this unit.

Operation

Make sure that the TV's power is in standby mode.

Press TRINITRON TV SYNCHRO PLAY VHS and hold the remote commander in place for about two seconds.

This unit and TV turn on, and the TV is set to VIDEO IN 1 reception. If there is a tape in this unit, playback starts automatically.

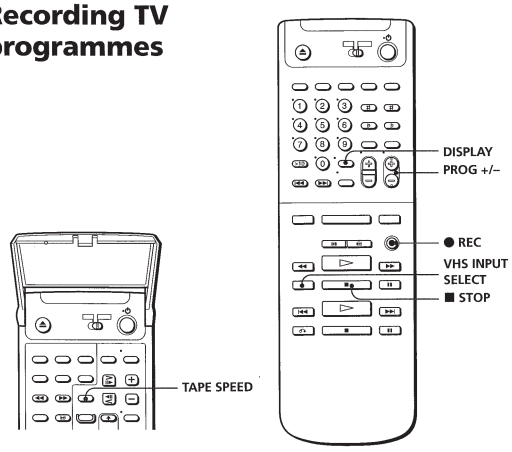


Notes

- If the Trinitron TV Synchro Play function does not work properly:
  - Wait a few moments, and press the button again.
  - Replace both of the batteries with new ones, and press the button again.

  Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY VHS while playing back a video tape. If you do so, the TV's input source will momentarily switch to the TV's tuner.

Recording TV programmes

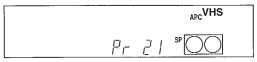


1 Turn on your TV and set it to the video channel.

2 Insert a tape with its safety tab in place into the VHS part of this unit.

3 •PROG

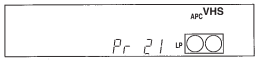
Press PROG +/– to select the programme position you want to record.



4 TAPE SPEED

Press TAPE SPEED to select the tape speed, SP or LP.

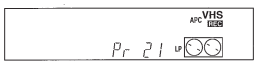
LP (Long Play) provides recording time twice as long as SP (Standard Play); however, SP produces better picture and audio quality.



5 REC

Press ● REC to start recording.

The VHS REC indicator appears in the display window.

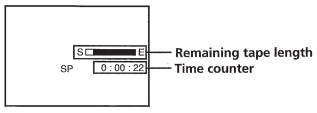


To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.



To watch another TV programme while recording

1 If the TV is connected to the unit using an audio/video cable, set the TV to TV input. If the TV is connected to the unit using only the aerial cable, skip this step.

2 Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on the tape again, cover the tab hole with adhesive tape.

Recording TV programmes (continued)

To record NTSC colour system programmes

The unit can record NTSC signals from the built-in tuner, LINE-1 IN, and LINE-2 IN jacks.

For tape speed, select SP or EP in step 4.

EP (Extra Play) provides recording time three times as long as SP; however, SP produces better picture quality.

When playing back, the unit automatically detects the tape speed.

Tips

- To select a programme position, you can use the programme number buttons on the remote. For two-digit numbers, press the -/– (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 IN or LINE-2 IN jacks using VHS INPUT SELECT or PROG +/– buttons. When you use PROG +/–, "L1" or "L2" appears in the display window between the lowest programme position and the highest one.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV

Notes

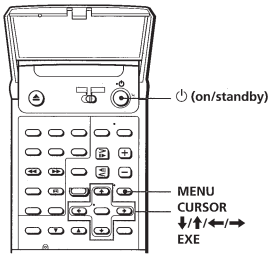
- It may take up to one minute for the unit to calculate and display the remaining tape length after you press DISPLAY.
- The remaining tape length does not appear while playing or recording in NTSC system.
- If you've inserted a tape with its safety tab removed, the unit ejects it when you press ● REC.

Recording TV programmes using the timer

You can preset up to eight programmes at a time.

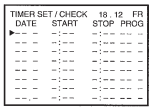
Before you start...

- Check that the clock of this unit is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1 MENU

Press MENU and select TIMER SET/CHECK, then press EXE.



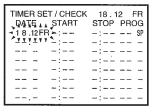
2 EXE

Set the date, start and stop times, programme position, and tape speed:

1 Press CURSOR → to flash each item in turn.

2 Press CURSOR ↑/↓ to set each item.

To correct a setting, press CURSOR ← to return to that setting and reset.



To record the same programme every day or the same day every week, press CURSOR ↓ while the date is flashing. For details, see "Daily/weekly recording" on the next page.

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks; press VHS INPUT SELECT or PROG +/– to display "L1" or "L2" in the "PROG" position.

continued

Recording TV programmes using the timer (continued)

3 EXE

Press CURSOR → to confirm the setting.

The cursor (▶) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4 EXE

Press EXE.

5

Press ⏻ (on/standby) to turn off the unit.

The TIMER REC indicator lights up and the unit stands by for recording.

To record from other equipment, leave the connected equipment switched on.

To stop recording

To stop the unit while recording, press ■ STOP.

Daily/weekly recording

In step 2 above, press CURSOR ↓ to select the recording pattern. Each time you press CURSOR ↓, the indication changes as shown below. Press CURSOR ↑ to change the indication in reverse order.

the current date → SU-SA → MO-SA → MO-FR → EVR (every) SA ..... → EVR MO → EVR SU → 1 month later → (dates count down) → the current date

Tips

- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To record NTSC signals, set the tape speed to SP or EP. To set the EP mode, display "LP" in the tape speed position.

Note

- The TIMER REC indicator flashes when you press ⏻ (on/standby) with no tape inserted.

The VCD part of this unit can play the various discs

	VIDEO CDs	Audio CDs
Disc logo	COMPACT disc DIGITAL VIDEO	COMPACT disc DIGITAL AUDIO
Contents	Audio + Video (moving pictures)	Audio
Disc size	12 cm/8 cm	12 cm/8 cm (CD single)
Play time	74 min./ 20 min.	74 min./ 20 min.

To play a VIDEO CD

See page 36.

To enjoy PBC Playback of a VIDEO CD with PBC functions

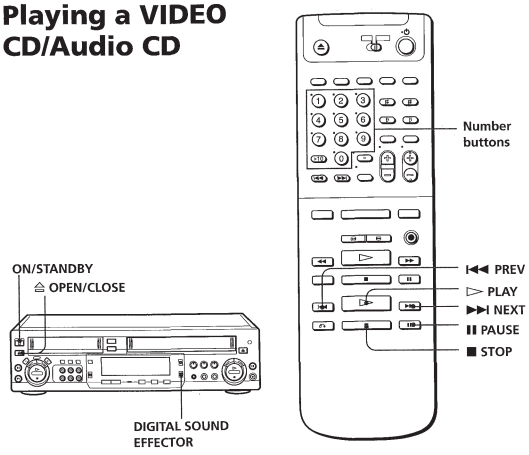
See page 70.

Note on VIDEO CDs

This unit conforms to Ver. 1.1 and Ver. 2.0 of VIDEO CD standards. You can enjoy two kinds of playback according to the disc type.

Disc type	You can
VIDEO CDs without PBC functions (Ver. 1.1)	Enjoy video playback (moving pictures) as well as music.
VIDEO CDs with PBC functions (Ver. 2.0)	Play interactive software using menu screens displayed on the TV screen (PBC Playback), in addition to the video playback functions of Ver 1.1 discs. Moreover, you can play high-resolution still pictures.

Playing a VIDEO CD/Audio CD



1

Turn on your TV and set it to the video channel.

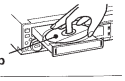
When using an amplifier, turn on the amplifier and select this unit position.

2 ON/STANDBY

Press ON/STANDBY to turn on the unit.

3 OPEN/CLOSE

Press ⏏ OPEN/CLOSE, and place the disc on the disc tray.



4 PLAY SELECT

Press ▷ PLAY.

The disc tray closes and the unit plays all the tracks once (Continuous Play).

Additional tasks

To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ▷ PLAY
Go to the next track or scene*	▶▶❙ NEXT
Go back to the preceding track or scene*	❙◀◀ PREV
Locate a specific track	▶▶❙ NEXT or ❙◀◀ PREV, number button of the track
Locate a specific part of a track or scene	and hold ▶▶ or ◀◀ down, or ⊜ (Locked search)
Stop play and remove the CD	⏏ OPEN/CLOSE

* VIDEO CDs with PBC functions (Ver 2.0) only

Sound effect

You can use the surround sound effect. To activate the surround function, set the DIGITAL SOUND EFFECTOR switch to SURROUND.

To give a monaural source the effect of a stereo sound, set the DIGITAL SOUND EFFECTOR switch to MONO EXPANDER. The MONO EXPANDER function also works for monaural sound from LINE INPUT.

To cancel the surround sound effect

Set the DIGITAL SOUND EFFECTOR switch to OFF.

Tips

- When "RESUME" appears in the display window, you can resume playback from the point where you stopped the VIDEO CD.
- Automatic pause function works according to the signal encoded on the disc during VIDEO CD playback. If the unit doesn't resume play for a long time, press ❚❚ or ▷ to resume play manually.
- A track is a section of a picture or a music piece on a disc. Each track is assigned track number to enable you to locate the track you want.
- To change the output signal to LINE OUT to the VCD signal manually, press OUTPUT SELECT VCD.

Notes

- When playing a VIDEO CD with PBC functions, in Step 4, the menu screen appears on the TV screen. You can play the VIDEO CD interactively, following the instructions on the menu screen.
- You need to press the OUTPUT SELECT VCD button to select the VCD part before playing when OUTPUT SEL is set to NORMAL under SET UP MENU in the menu system.

continued

Turning on this unit and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

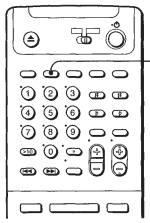
Connect this unit and TV with the audio/video cable (see "Connecting the unit" on page 6.) Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at this unit.

Operation

Make sure that the TV's power is in standby mode.

Press TRINITRON TV SYNCHRO PLAY VCD and hold the remote commander in place for about two seconds.

This unit and TV turn on, and the TV is set to VIDEO IN 1 reception. If there is a disc in this unit, playback starts automatically.



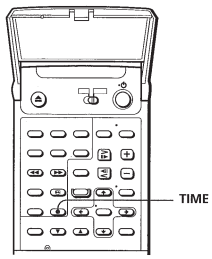
Notes

- If the Trinitron TV Synchro Play function does not work properly:
  - Wait a few moments, and press the button again.
  - Replace both of the batteries with new ones, and press the button again.

  Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY VCD while playing back a VCD or audio CD. If you do so, the TV's input source will momentarily switch to the TV's tuner.

Using the display window

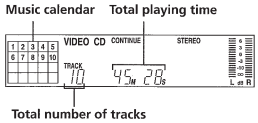
You can check information about the disc using the display window.



Checking the total number and playing time of the tracks

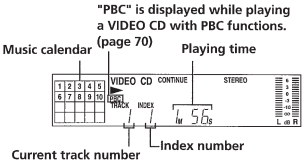
Press TIME before you start playing.

The information also appears when you press ⏏ OPEN/CLOSE to close the disc tray.



Display information while playing a disc

While playing an audio CD or a VIDEO CD without PBC functions, the display window shows following items.



continued

The track numbers in the music calendar disappear after they are played.

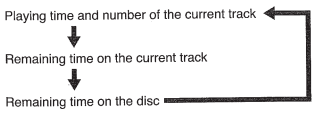
While playing a VIDEO CD with PBC functions, the track numbers and the music calendar aren't displayed. However, while the menu screen is displayed on the TV screen, the item numbers you can select in the menu appear in the music calendar.

Note that you cannot select some item numbers even if they appear in the music calendar.

Checking the remaining time

Each time you press TIME while playing a disc, the display changes as shown in the chart below.

Note that you cannot check the remaining time during PBC Playback (page 70).



Note

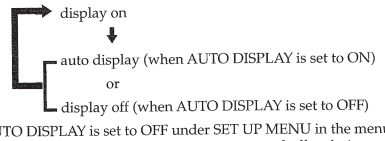
- Remaining time on the disc does not appear in Program Play mode if the remaining time exceeds 100 minutes.

When using the on-screen display

You can check the operating status of the unit and the information about a VIDEO CD and an audio CD with the on-screen display on the TV screen.

Press DISPLAY.

Each time you press the button, the on-screen display changes as follows:



When AUTO DISPLAY is set to OFF under SET UP MENU in the menu system, the on-screen display changes between on and off each time you press DISPLAY.

Display information of DISPLAY OFF mode

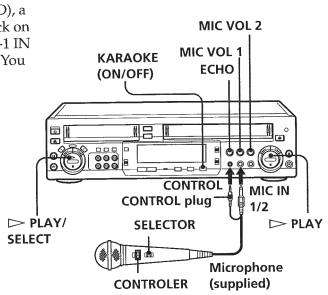
No information is displayed.

Notes

- Select the display mode other than DISPLAY OFF for normal operation. When you select DISPLAY OFF, you cannot check the operating status while operating the unit. In this case, check the information in the display window.
- When you record the playback picture of this unit on another VCR, etc., be sure to select DISPLAY OFF. Otherwise, the display information is also recorded on this unit.

Before you start karaoke

You can sing along with a karaoke source (video tape, VCD, audio CD), a TV broadcast, or music played back on equipment connected to the LINE-1 IN jacks at the rear panel of the unit. You can sing duets if you use an extra microphone (not supplied).



1 Turn on your TV and set it to the video channel.

When using an amplifier, turn on the amplifier and select this unit position.

2 Connect the supplied microphone to the MIC IN 1 jack and its control plug to the CONTROL jack. To sing duets, connect another microphone (not supplied) to the MIC IN 2 jack.

Note

- When the VHS part is in stop mode, the sound from the microphone may not go out. To listen to the sound in stop mode, press INPUT SELECT 2.

Karaoke sing-along

Singing along with karaoke video tapes

1 Press KARAOKE (ON/OFF).

The KARAOKE (ON/OFF) button lights up. "KEY 0" appears in the display window, and "KARAOKE MODE WELCOME TO THE Sony KARAOKE WORLD" appears on the TV screen.

2 Insert a karaoke video tape.

The unit turns on and starts playing automatically if you insert a tape with its safety tab removed.

3 Press ▷ PLAY of the VHS part.

If you want to playback a specific song, see "Searching with the index function" on page 52.

4 Set the SELECTOR on the microphone to KEY or S.D.

Now you can enjoy playing karaoke.

Singing along with karaoke VIDEO CD

1 Press ON/STANDBY to turn on the unit.

2 Press KARAOKE (ON/OFF).

KARAOKE (ON/OFF) button lights up. "KEY 0" appears in the display window, and "KARAOKE MODE WELCOME TO THE Sony KARAOKE WORLD" appears on the TV screen.

3 Press ⏏ OPEN/CLOSE, and place the disc on the disc tray.

4 Press ▷ PLAY of the VCD part.

The disc tray closes and playback starts. If you want to playback a specific song, see "Playing a VIDEO CD/Audio CD" on page 36.

5 Set the SELECTOR on the microphone to KEY or S.D.

Now you can enjoy playing karaoke.

To adjust the microphone volume

Turn the MIC VOL 1 control for the microphone connected to MIC IN 1.

Turn the MIC VOL 2 control for the microphone connected to MIC IN 2.

Setting the MIC VOL 1 and/or 2 control(s) to the centre position provides the best microphone volume.

To control the echo effect

Turn the ECHO control. This controls both microphones' echo effect in the same way.

To get the best effect, adjust the microphone volume to a level slightly higher than the music volume.

continued

Sound effect

You can use the surround sound effect. To activate the surround function, set the DIGITAL SOUND EFFECTOR switch to SURROUND.

To give a monaural source the effect of a stereo sound, set the DIGITAL SOUND EFFECTOR switch to MONO EXPANDER. The MONO EXPANDER function also works for monaural sound from LINE INPUT.

To cancel the surround sound effect

Set the DIGITAL SOUND EFFECTOR switch to OFF.

Tip

- When you sing along with TV broadcasts or music played back on equipment connected to the LINE-1 IN jacks on this unit, play the music source and, then press KARAOKE and set the SELECTOR on the microphone to KEY or S.D.

Notes

- If the sound is reproduced through a stereo amplifier, turn down the volume of amplifier before operation.
- If streaks appear during playback, select the colour system that the tape was recorded in (see "To set the colour system" on page 27).
- If feedback occurs, turn down the microphone or TV volume, or move the microphone away from the speakers.

Using the supplied microphone

CHOI button

Monitor the picture in reverse while pressing this button.

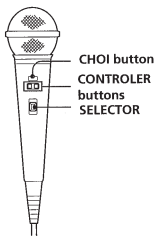
SELECTOR switch

When you want to use the Key Control function or Self Duet function, select KEY or S.D (pages 76, 77).

CONTROLER buttons

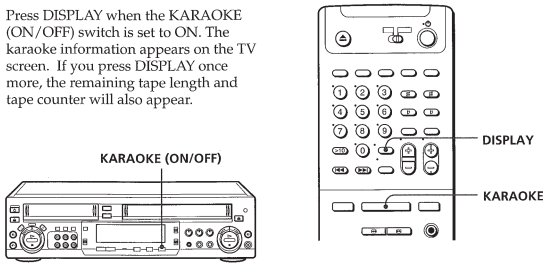
When you select KEY, change the pitch from ♯ 8 to ♭ 8 using these buttons. To return to the original pitch, press KEY CONTROL ♭ or ♯ until "0" appears in the display window (page 76).

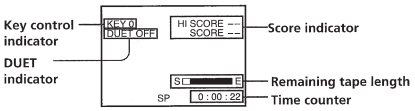
When you select S.D., press ♯ for S.D.♯, ♭ for S.D.♭. To cancel Self Duet, press the same button again (page 77).



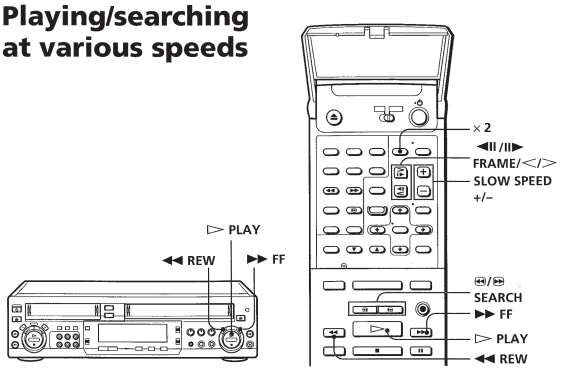
Displaying the karaoke information

Press DISPLAY when the KARAOKE (ON/OFF) switch is set to ON. The karaoke information appears on the TV screen. If you press DISPLAY once more, the remaining tape length and tape counter will also appear.





Playing/searching at various speeds



Playback options	Operation
Fast-forward/rewind	During stop, press ▶▶ FF or ◀◀ REW.
View the picture during fast-forward or rewind	During fast-forward, hold ▶▶ FF down. During rewind, hold ◀◀ REW down.
Play at twice the normal speed	During playback, press × 2.
Play at high speed	During playback or pause, press ⏩ SEARCH or ⏪ SEARCH. To change direction, press > or <.
Play in slow motion	During playback or pause, press SLOW SPEED +/–. Press the +/– buttons to change the speed. To change direction, press > or <.
Play frame by frame	During pause, press II▶ FRAME or ◀II FRAME. Hold the button down to play one frame each second.
Play in reverse	During playback, press <.
Rewind and start play	During stop, hold ◀◀ REW on the unit down and press ▷ PLAY on the unit.

To resume normal playback

Press ▷ PLAY.

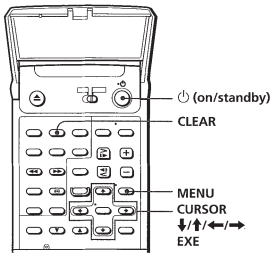
Tip

- Adjust the picture using TRACKING AUTO/MAN and ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST (page 53) if:
  - streaks appear while playing in slow motion
  - bands appear at the top or bottom while pausing
  - the picture shakes while pausing.

Note

- In LP mode, noise may appear or there may be no colour.

Checking/ changing/ cancelling timer settings



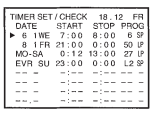
Before you start...

- Turn on your TV and set it to the video channel.

1 Press ⏻ (on/standby) to turn on the unit.

2 Press MENU, then select TIMER SET/CHECK:

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press EXE, then turn off the unit to return to recording standby.



3 Press CURSOR ↑/↓ to select the setting you want to change or cancel:

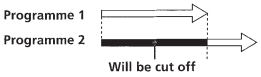
- To change the setting, press CURSOR ←/→ to flash the item you want to change, and press CURSOR ↑/↓ to reset it. Then, press CURSOR → repeatedly until the cursor (▶) appears at the beginning of the line.
- To cancel the setting, press CLEAR.

4 Press EXE.

If any timer settings remain, turn off the unit to return to recording standby.

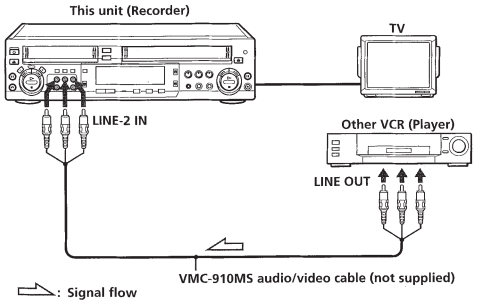
When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Editing with another VCR

How to connect to record on the VHS part of this unit

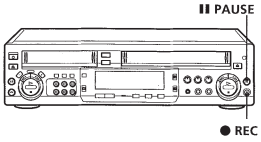


Notes

- Make sure you connect the plugs to jacks of the same colour.
- If the other VCR is a monaural type, leave the red plugs unconnected.
- When connecting, do not simultaneously connect the LINE-2 IN and LINE OUT jacks on this unit. A humming noise may occur if you do this.

continued

Operation (when recording on the VHS part of this unit)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT 2 to light up the button (or press VHS INPUT SELECT on the remote commander until "LINE 2" appears).
- Press TAPE SPEED to select the tape speed (SP or LP for the PAL system, and SP or EP for the NTSC system).

1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into the VHS part of this (recording) unit. Search for the point to start recording and press II PAUSE.

3 Press ● REC on the VHS part of this unit and set it to recording pause.

4 To start editing, press the II PAUSE buttons on the VCR and this VHS part at the same time.

To stop editing

Press the ■ STOP buttons on the VCR and this VHS part.

Tips

- To edit more precisely, press the II PAUSE buttons on the VCR and this VHS part to release pause.
- To cut out unwanted scenes while editing, press II PAUSE on this VHS part when an unwanted scene begins. When it ends, press II PAUSE again to resume recording (Assemble Editing).

Note

- If you start recording following the procedure above, the VHS part of this unit won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that this unit analyses the tape. Then when you start recording in step 4, press II PAUSE after the APC indicator stops flashing. If you press II PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Recording stereo programmes

The VHS part of this unit can record stereo and bilingual programmes only through the line input. When you select the line input, the STEREO indicator always appears in the display window no matter if the signal is monaural or stereo. You cannot select the sound to listen to while recording.

Selecting the sound during playback

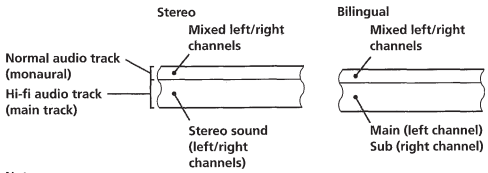
Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	"STEREO" lights up
Left channel/main	LCH	"L" under the sound indicator lights up
Right channel/sub	RCH	"R" under the sound indicator lights up
Standard sound*	No indication	No indication

* The mixed sound of left and right channels (monaural)

How sound is recorded on a video tape

The VHS part of this unit records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



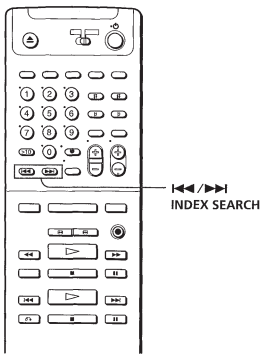
Notes

- To listen to playback sound in stereo, you must use the AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX under SET UP VHS is set to OFF (page 54).

Searching with the index function

You can search for the start of a specific passage or scene (Index search).

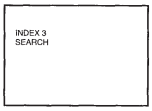
The VHS part of this unit can search up to 99 index signals ahead or behind the current position.



1 Insert an indexed tape into the VHS part of this unit.

2 Press I◀◀ / ▶▶I INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search forward, press ▶▶I INDEX SEARCH.
- To search backward, press I◀◀ INDEX SEARCH.



This unit starts searching. The specified number of index signals is displayed on the TV screen, and it counts down to zero. At the end of the search, playback starts automatically.

To stop searching

Press ■ STOP.

Note

- No index signal will be added when recording starts from recording pause.

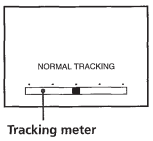
Adjusting the picture

Adjusting the tracking

Although the VHS part of this unit automatically adjusts the tracking when playing a tape (the M indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

1 Press TRACKING AUTO/MAN to change to manual adjustment.

2 Press ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST to display the tracking meter. The distortion should disappear as you press one of the two buttons. (The M indicator lights up.)

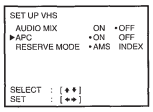


Tracking meter

If you cannot get a clear picture with manual adjustment, press TRACKING AUTO/MAN to return to automatic adjustment.

About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting this unit to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON under SET UP VHS (with the APC indicator in the display window lit).



APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VHS part of this unit adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the APC

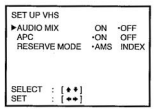
Press MENU and select SET UP VHS, then set APC to OFF. The APC indicator in the display window goes off.

Note

- There is a delay of a few seconds before this unit actually starts recording while the unit analyses the tape. To avoid the delay, first set this unit to recording pause (the APC indicator flashes slowly) and press ● REC to have this unit analyse the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately. If you want to start recording quickly without using the APC function, first set this unit to recording pause (the APC indicator flashes slowly) and press ❚❚ PAUSE to start recording.

Changing menu options

1 Press MENU and select SET UP VHS.



2 Press CURSOR ↑/↓ to select the option to change, then press CURSOR ←/→ to change the setting.

3 Press EXE to return to the original screen.

Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
AUDIO MIX	• ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. • **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.
APC	• **ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality. • OFF to switch off APC.
RESERVE MODE	• **AMS** for automatic music search of blank spaces in the sound track. • INDEX for index function search of index signal.

Notes

- AMS locates only the blank spaces of more than about 8 seconds.
- INDEX works only when the blank space is more than about 4 seconds long and an index signal is recorded.
- The settings in the menu return to initial settings when you disconnect the mains lead.

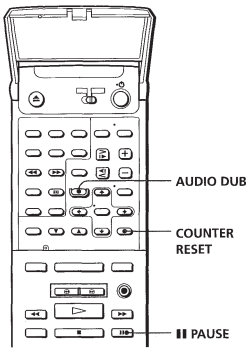
Audio dubbing

This feature lets you record over the normal audio track. The monaural sound previously recorded is replaced while the original hi-fi sound remains unchanged. You can also record your karaoke performances.

Audio dubbing from a stereo system or other external source

Before you start...

- Turn on your TV and set it to the video channel.
- Press VHS INPUT SELECT to display "L1" in the display window.



1 Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback, and set that equipment to playback pause.

2 Insert a prerecorded tape into this (recording) unit. Search for the end of the section to be replaced and press ❚❚ PAUSE.

Make sure that the tape has its safety tab in place.

3 Press COUNTER RESET to reset the counter to "0H00M00S."

4 Search for the beginning of the section to be replaced and press ❚❚ PAUSE.

5 Press AUDIO DUB.

The ⊖ indicator appears in the display window.

6 To start editing, press the ❚❚ PAUSE buttons on this unit and the stereo system (or other VCR) at the same time.

When the counter reaches "0H00M00S," audio dubbing stops automatically.

To stop while recording

Press the ■ STOP buttons on this unit and the stereo system (or other VCR).

continued

To listen to both the hi-fi and normal audio

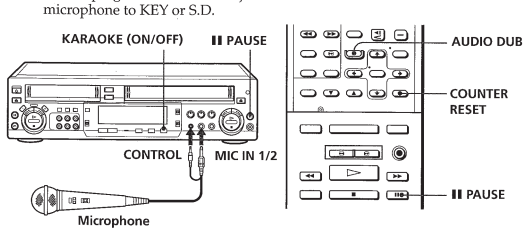
Set AUDIO MIX to ON under SET UP VHS in the menu system (page 54). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

Audio dubbing from the microphone

Using the microphone, you can add songs or narration on a recorded tape during playback of the tape. Sound from the microphone is recorded on the normal audio track together with the left sound and right sound of the original hi-fi sound.

Before you start...

- Connect the microphone(s) to the MIC IN 1 and/or 2 jack(s), and its control plug to the CONTROL jack. And then set the SELECTOR on the microphone to KEY or S.D.



1 Set KARAOKE (ON/OFF) to ON.

2 Insert the prerecorded tape into the VHS part of this unit. Search for the end of the section to be replaced and press ❚❚ PAUSE.

Make sure that the tape has its safety tab in place.

3 Press COUNTER RESET to reset the counter to "0H00M00S."

4 Search for the beginning of the section to be replaced and press ❚❚ PAUSE.

5 Press AUDIO DUB.

The ⊖ indicator appears in the display window.

6 To start editing, press ❚❚ PAUSE to start dubbing and sing or speak into the microphone.

When the counter reaches "0H00M00S," audio dubbing stops automatically.

To stop while recording

Press ■ STOP.

To listen to the dubbed sound

When playing an audio-dubbed tape, you have a choice of sound to listen to. For the dubbed sound, select standard sound with the AUDIO MONITOR button (page 51).

To record sound from the microphone mixed with an external source

If you connect equipment such as a laser disc player to this unit's LINE-1 IN jacks, you can record while singing along to a karaoke LD. Be sure to press VHS INPUT SELECT to display "L1" before starting recording. The mixed sound is recorded on the normal audio track, and the sound input from the LINE-1 IN jacks is recorded on the hi-fi audio track.

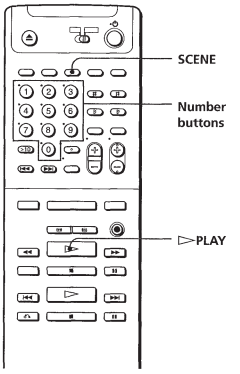
Tip

- When dubbing from the microphone, you can use the functions of echo effect, key control, and Self Duet.

Notes

- Do not dub on a tape recorded in LP mode. Audio noise may occur.
- Recording stops if you press the COUNTER RESET button while audio dubbing.

Locating scenes directly using the scene numbers (Scene Search)

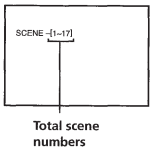


On a VIDEO CD with PBC functions, the menu screens, moving pictures and still pictures are divided into "scenes" and each scene is assigned with a scene number.

You can check the current scene number by displaying it on the TV screen during playback (page 40). Be sure to memorise the scene number from which you want to start playing.

1 Press SCENE before you start playing or while playing a disc.

"SCENE –" and the scene numbers appear on the TV screen.



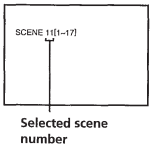
2 Press the number buttons (0 - 9) to select the scene.

The selected scene number appears on the TV screen.

If you've made a mistake, press the correct number button again.

When you change a number under 10, press 0 and then the correct number.

Example: To change 2 to 5, press 0, then 5.



3 Press ▷ PLAY to start playing from the selected scene.

The unit automatically starts PBC Playback.

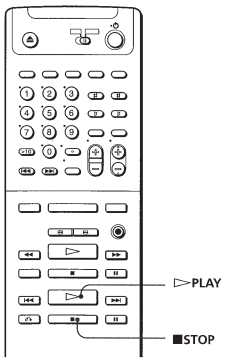
To check the scene number while playing a disc

Press DISPLAY (page 40). The scene numbers appear on the upper left side of the TV screen.

Notes

- Some discs don't allow you to start playing from a particular scene. In this case, when you do the task before you start playing, the unit starts playing from scene 1. When you do the task while playing a disc, the unit starts playing from the current scene.
- Some discs don't display the selected scene on the TV screen.

Resuming playback from the point you stopped a VIDEO CD (Resume Play)



The VCD part of this unit memorises the point you stopped a VIDEO CD and you can resume playback from that point.

Resume Play is not cancelled whenever you turn off the VCD part of this unit.

Note that Resume Play is not available while playing an audio CD.

1 While playing a VIDEO CD, press ■ STOP to stop playback.

"RESUME" appears in the front panel display and on the TV screen.

If "RESUME" doesn't appear, Resume Play is not available.

2 Press ▷ PLAY.

The unit starts playback from the point you stopped the VIDEO CD in Step 1.

To view from the beginning of the VIDEO CD

When "RESUME" appears in the front panel display, press ■ STOP, then press ▷ PLAY.

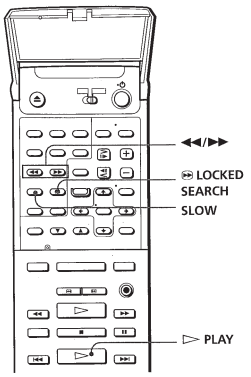
Notes

- Resume Play is not available in Shuffle or Programme Play mode.
- Depending on where you stopped the VIDEO CD, the unit may resume playback from a different point.
- The point at which you stopped playing is cleared when:
  - you press number buttons or ■ STOP
  - you remove the VIDEO CD from the unit
  - you unplug the mains lead of the unit

Locating a particular point in a scene or track

You can also locate a particular point in a scene or track while playing a disc.

During PBC Playback (page 70), this function is available only while playing moving pictures.



To locate a point	Press
While monitoring the picture or sound	, or ▶▶ (forward) / ◀◀ (backward) and hold down until you find the point. You will not hear the sound while playing a VIDEO CD.
Slowly by observing the TV screen (Slow-motion Play*)	SLOW. You will not hear the sound during the operation. When you find the point, press ▷ to return to the normal speed.
Quickly by observing the display window during pause	◀◀/▶▶ and hold down until you find the point. You will not hear the sound during the operation.

* While playing an audio CD, Slow-motion Play is not available.

If "⌐| ⌐|" appears in the display window

The disc has reached the end while you were pressing ▶▶. Press ◀◀ or I◀◀ PREV to go back.

If you want to change the playback speed during Slow-motion Play

Press SLOW repeatedly until you find the playback speed you want. Three speeds are available: SLOW 1 (1/5th the normal speed), SLOW 2 (1/10th) and SLOW 3 (1/15th).

Note

- While playing a VIDEO CD, the picture may be distorted during the search operation.

continued

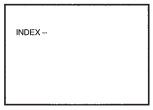
Locating a point using the index (Index Search)

There are two kinds of indexes: one is for audio CDs and the other is for VIDEO CDs. You can locate a point you want using the index.

Note that this function is available only for indexed discs. Also note that you cannot search indexes in different tracks.

1 Press INDEX while playing a disc.

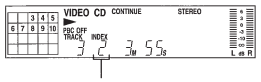
"INDEX –" appear on the TV screen.



2 Press the number buttons (0 - 9) to select the index number.

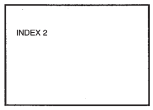
The selected index number appears on the TV screen.

Display window



Selected index number

If you've made a mistake, press the correct number button again.



3 Press ▷ PLAY to start playing from the selected index.

The unit automatically starts playback.

Tip

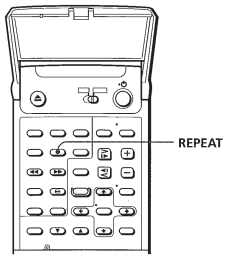
- Index is a number that divides a track or a disc into some sections in order to easily locate the point you want. You may determine if a disc uses index by looking at the disc's packaging.

Notes

- If there is no index, "THERE IS NO INDEX" appears on the TV screen.
- If the index which you select is not recorded, "THIS NUMBER DOES NOT EXIST" appears on the TV screen.

Playing repeatedly

You can play all the tracks, a single track or a specific portion repeatedly.



Repeating all the tracks on a disc

In Shuffle or Programme Play mode, the unit repeats the track in the shuffled or programmed order. You cannot do Repeat Play during PBC playback (page 70) .

Press REPEAT while playing a disc.

" ↻ " appears in the display window. The unit repeats the tracks as follows:

When the disc is played in	The unit repeats
Continuous Play (page 36)	All the tracks
Shuffle Play (page 66)	All the tracks in random order
Programme Play (page 67)	The same programme

To cancel Repeat Play

Press REPEAT repeatedly until " ↻ " disappears from the display window.

Repeating the current track

You can repeat only the current track in Continuous Play mode (page 36).

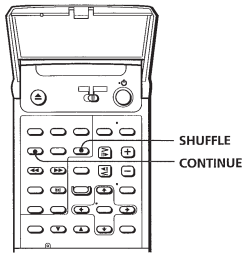
While the track you want is being played, press REPEAT repeatedly until " 🔁 1" appears in the display window.

To cancel repeating the current track

Press REPEAT repeatedly until " 🔁 1" disappears from the display window.

Playing in random order (Shuffle Play)

You can have the unit "shuffle" tracks and play in a random order.



1 Press SHUFFLE.

"SHUFFLE" appears in the display window.

2 Press ▷ PLAY to start Shuffle Play.

The "🔀" indication appears while the unit is "shuffling" the tracks.

To cancel Shuffle Play

Press CONTINUE.

"CONTINUE" appears in the display window.

To start Shuffle Play while playing in Continuous Play mode

Press SHUFFLE.

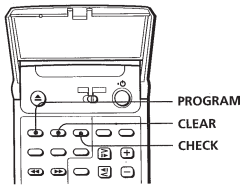
Shuffle Play starts from the current track.

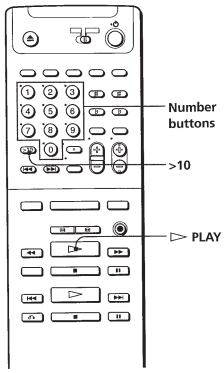
Note

- If you play a VIDEO CD with PBC functions in Shuffle Play mode, you cannot use the PBC functions.

Creating your own programme (Programme Play)

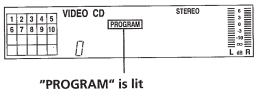
You can arrange the order of the tracks on the discs and create your own programme. The programme can contain up to 24 tracks.





1 Press PROGRAM.

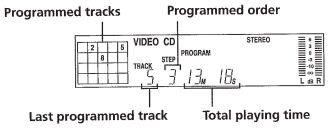
"PROGRAM" appears in the display window.



"PROGRAM" is lit

2 Press the number buttons of the tracks you want to programme in the order you want.

To programme a track numbered over 10, use the >10 button.



If you've made a mistake, press CLEAR, then press the correct number button.

3 Press ▷ PLAY to start Programme Play.

continued

To cancel Programme Play

Press CONTINUE.

"CONTINUE" appears in the display window.

To programme while checking the total playing time instead of step 2 (Programme Edit)

1 Press ⏮ PREV or ⏭ NEXT until the track you want to programme appears in the display window.
The total playing time including the selected track appears in the display window.

2 Press PROGRAM to confirm your selection.

3 Repeat steps 1 and 2 to programme more tracks.

To insert a pause as one step

During programming, press ⏸ PAUSE to insert a pause. The total playing time is reset to "0.00."

When playing a programme which contains a pause, the unit pauses at the step in which a pause is programmed, until you press ⏸ PAUSE or ▷ PLAY. This might be useful when you record a programme on both sides of a tape.

Tip

- The programme remains even after the Programme Play ends. When you press ▷ PLAY, you can play the same programme again.

Notes

- If you play a VIDEO CD with PBC functions in Programme Play mode, you cannot use PBC functions (page 70).
- If the total playing time exceeds 100 minutes, "– – . – –" appears in the display window.
- If you programme more than 24 tracks, "FULL" appears on the TV screen.

Checking the track order

Press CHECK before or after you start playing.

Each time you press this button, the display window shows the track number and the total playing time in the programmed order. After the last track in the programme, the display window shows "End" and returns to the original display. If you check the order after you start playing, the display window shows only the remaining track numbers and playing time.

Changing the track order

You can change your programme before you start playing.

To	Press
Erase a track	CHECK until the track you don't want appears in the display, then press CLEAR.
Erase the last track in the programme	CLEAR. Each time you press this button, the last track is cleared.
Add tracks to the end of the programme	Number buttons of the tracks to be added.
Change the whole programme completely	■ STOP. Create a new programme.

Tip

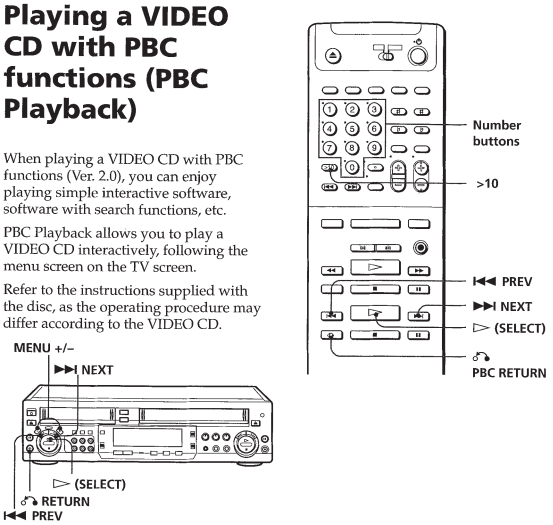
- You can check the contents of the programme during programming on the TV screen.
  If you press DISPLAY to select display off mode, you won't see this information (page 41).

Playing a VIDEO CD with PBC functions (PBC Playback)

When playing a VIDEO CD with PBC functions (Ver. 2.0), you can enjoy playing simple interactive software, software with search functions, etc.

PBC Playback allows you to play a VIDEO CD interactively, following the menu screen on the TV screen.

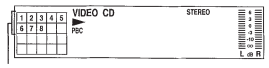
Refer to the instructions supplied with the disc, as the operating procedure may differ according to the VIDEO CD.



1 Start playing a VIDEO CD with PBC functions, following Steps 1 through 4 in "Playing a VIDEO CD/Audio CD" on page 36.

The menu screen appears on the TV screen and "SELECT" flashes. The MENU indicator on the unit flashes and the item numbers you can select in the menu appear in the display window.

Note that some item numbers cannot be selected even if they appear in the display window.



Item numbers you can select

2 Select the item number you want.

- On the unit:
  Press MENU + or – to select the item number, then press ▻ (SELECT).
- On the remote commander:
  Press the number button of the item you want.
  When you want to select an item number over 10, press >10 first, then the corresponding number buttons.

3 Follow the instructions on the menu screen for interactive operations.

To	Press (on the remote commander)
Stop play	■ STOP
Select the item (while the MENU indicator is flashing)	number buttons on the remote commander or MENU +/–, then ▻ (SELECT)
Go back to the menu screen	PBC RETURN , I◄◄ PREV, or ►►I NEXT.

To cancel PBC Playback of a VIDEO CD with PBC functions and play the disc in Continuous Play mode

There are three ways.

- Press PBC ON/OFF.
- Before you start playing, select the track you want with I◄◄ PREV or ►►I NEXT, then press ▻ PLAY.
- Before you start playing, select the track number using the number buttons on the remote commander.

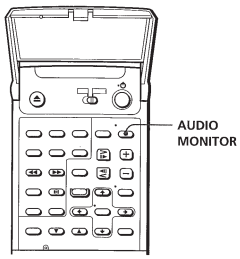
"PBC OFF" appear in the display window and the unit starts Continuous Play. You cannot play still pictures such as a menu screen. You cannot cancel PBC playback by pressing CONTINUE.

Note

- When "YOU CANNOT USE THIS KEY NOW"appears on the TV screen, you've pressed an invalid button. Press the correct button, following the instructions on the menu screen.

Switching the sound

On multiplex discs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers. In this case, the sound loses the stereo effect.



Press AUDIO MONITOR while playing a disc.

Each time you press the button, the indication and the sound from the speakers change as follows:

Press	Indication*	You will hear
Once	L ch	The sound of the left channel
Twice	R ch	The sound of the right channel
Three times	STEREO	The standard stereo sound

* When you select display off mode, check the indication in the display window.

Note

- When you turn off the unit, the standard stereo playback will be resumed.

Programming the order of the songs

You can programme the order of the songs. The programme can contain up to 12 songs.

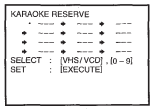
1 Press KARAOKE (ON/OFF).

The KARAOKE (ON/OFF) button lights up.

2 Insert a karaoke video tape or/and press ⏏ OPEN/CLOSE and place the disc on the disc tray.

3 Press RESERVE.

The KARAOKE RESERVE menu appears on the TV screen.



4 Press OUTPUT SELECT VCD or OUTPUT SELECT VHS to select karaoke source.

5 Press the number buttons of the songs you want to programme using double digits.

Example: To select song number 5, press 0, then 5.

If you've made a mistake, press CURSOR ←/→ to select the desired programme, then press correct karaoke source and number button.

6 Repeat steps 4 and 5 to programme the order you want.

7 Press EXECUTE to start playing.

The video tape automatically rewinds to the beginning, and playback starts in the order you selected. While the unit searches for a song, the song number flashes in the display window.

To stop playing

Press ■ STOP.

To go to the next song

Press ▶▶| INDEX SEARCH or ▶▶| NEXT.

To repeat the current song

Press |◀◀ INDEX SEARCH or |◀◀ PREV.

To add songs while playing

Repeat steps 3 to 5. You can enter up to 12 songs.

continued

To select the way of searching a video tape

When you stop playing, select on the RESERVE MODE under SET UP VHS in the menu system (page 54).

Tip

- During playback in KARAOKE RESERVE mode, you can change the programmed order. To change the order, press RESERVE and repeat steps 4 and 5.

Notes

- If you press KARAOKE (ON/OFF) to turn off the button, the list settings are cleared.
- This unit exits the KARAOKE RESERVE mode when you
  - -press ■ STOP.
  - -press KARAOKE (ON/OFF).
  - -press ⏻ (on/standby).
- If you rewind past the beginning of the current song using a microphone with CHOI function, the selected song order may not be played correctly.

Using the various functions

Reducing the playback vocals (Karaoke Pon)

You can use ordinary music sources with vocals for karaoke with this function. Use hi-fi stereo music sources.

Set KARAOKE MODE to KARAOKE PON.

The singer's voice will be reduced.

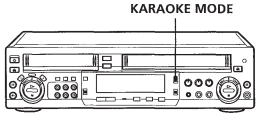
To cancel Karaoke Pon

Set KARAOKE MODE to OFF.

Note

- Karaoke Pon does not work with the following sources:
  - – Sources on which different vocal sounds are recorded on the left and right channels, such as a duet
  - – Sources recorded monaurally
  - – Sources on which sound sources are recorded with strong echo effects and chorus effects

Backing up your singing (Vocal Assist)



This unit can assist your singing in case you forget the lyrics while you are singing. The unit fills in the vocal for you automatically if you stop singing into the microphone.

Use karaoke stereo hi-fi sources which have the accompaniment music on the left channel and the accompaniment plus vocal on the right channel.

Set KARAOKE MODE to VOCAL ASSIST.

To cancel Vocal Assist

Set KARAOKE MODE to OFF.

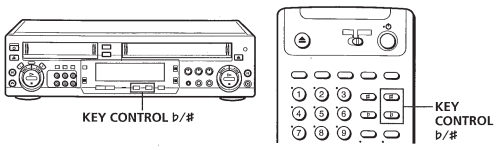
Notes

- Vocal Assist does not work with the following tapes:
  - – Hi-fi tapes on which a single sound is recorded on the left and right channels
  - – Monaural recorded tapes
- When the disc is recorded with the singer's voice on the left channel, set CD VOCAL SEL under SET UP MENU to Lch.

continued

Changing the pitch (Key Control)

While you are singing, you can change the pitch of the song to match your vocal range.



Press KEY CONTROL ♭ or ♯ repeatedly to set the pitch you want.

You can change the pitch of the song in half-note intervals.

The pitch you set appears in the display window.

To	Press	Range	Display window
Raise the pitch	♯ (sharp)	8 half notes	"♯1" to "♯8"
Lower the pitch	♭ (flat)	8 half notes	"♭1" to "♭8"

To return to the original pitch

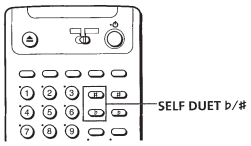
Press KEY CONTROL ♭ or ♯ until "0" appears in the display window.

Note

- If you connect an amplifier or TV to Video CD DIRECT OUT, you cannot use key control.

Adding harmony (Self Duet)

You can sing duets by yourself. This unit creates a harmony voice for your singing at an interval set with the key control.



Press SELF DUET ♭ or # to set the harmony interval.

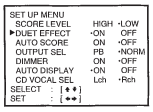
To	Press	Display window
Raise the pitch of the harmony voice	# (sharp)	"S.D.#"
Lower the pitch of the harmony voice	♭ (flat)	"S.D.♭"

To cancel Self Duet

Press SELF DUET ♭ or # again.

To improve Duet Effect

You can set this unit to add vibrato to the harmonized voice when the duet is not in harmony. Press MENU and select SET UP MENU, then set DUET EFFECT to ON.



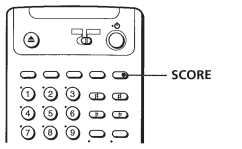
Note

- If you connect an amplifier or TV to Video CD DIRECT OUT, you cannot use self duet.

continued

Grading your singing

As an extra challenge, this unit can grade your singing.

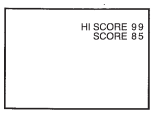


1 Start singing and press SCORE.

The SCORE appears on the TV screen, and this unit starts analysing your singing.

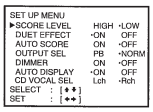
2 Press SCORE again after singing for more than one minute.

Your score appears on the TV screen for five seconds. The highest score (HIGH SCORE) is saved, and is indicated above your present score.



To set score level

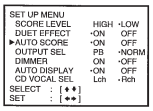
This unit has two different score levels. To set the score level, press MENU and select SET UP MENU. Then set SCORE LEVEL to HIGH for strict grading or LOW for easy grading.



To grade singing automatically

Press MENU and select SET UP MENU.

Then set AUTO SCORE to ON.



Tips

- The highest possible score is 99 points.
- To display your score on the TV screen again, press DISPLAY.
- The highest score is cleared each time you press KARAOKE (ON/OFF) to turn off the button.

Notes

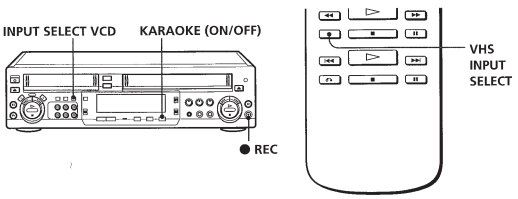
- The grading is not absolute. Please use this function for your own amusement.
- AUTO SCORE works only while playing programmed songs.
- When the sound level of a source is too low, the score may not be correct.

Recording your karaoke singing

You can record your singing with picture and sound of VIDEO CD on a video tape. Sound from the microphone is recorded on the normal track together with left sound and right sound of VIDEO CD.

Before you start...

- Connect the microphone(s) to the MIC IN 1 and/or 2 jack(s), and its control plug to the CONTROL jack. And then set the SELECTOR on the microphone to KEY or S.D.



1 Press KARAOKE (ON/OFF).

The KARAOKE (ON/OFF) button lights up.

2 Press INPUT SELECT VCD (or press VHS INPUT SELECT on the remote commander repeatedly until "VCD" appears).

3 Press ● REC, and enjoy playing karaoke.

To stop recording

Press ■ STOP.

Tip

- You can control the volume of the sound from a microphone using MIC VOL 1 or MIC VOL 2.

Precautions

Precautions

Safety

- Caution - The use of optical instruments with this product will increase eye hazard.
- This unit operates on 110 – 240 V AC, 50/60 Hz. Check that the unit's operating voltage is identical with your local power supply.
- If anything falls into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- The unit is not disconnected from the mains as long as it is connected to the mains, even if the unit itself has been turned off.
- Unplug the unit from the mains if you do not intend to use it for an extended period of time. To disconnect the cord, pull it out by the plug, never by the cord.
- Should the AC power cord (mains lead) need to be changed, have it done at a qualified service shop only.

Installing

- Allow adequate air circulation to prevent internal heat buildup.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install the unit in an inclined position. It is designed to be operated in a horizontal position only.
- Keep the unit and cassettes away from equipment with strong magnets, such as microwave ovens or large loudspeakers.
- Do not place heavy objects on the unit.
- If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit and cause damage to the video head and tape. When you first install the unit, or when you move it from a cold to a warm location, wait for about one hour before operating the unit.
- Do not turn up the volume while listening to a portion with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level portion is played.
- Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

Notes on Discs

On handling discs

- To keep the disc clean, handle the disc by its edge. Do not touch the surface.
- Do not stick paper or tape on the disc. If there is glue (or a similar substance) on the disc, remove the glue completely before using the disc.

Not this way

- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as there can be considerable rise in temperature inside the car.
- Do not use any commercially available stabiliser. If you do, the disc and the unit may be damaged.
- After playing, store the disc in its case.

On cleaning

- Before playing, clean the disc with a cleaning cloth. Wipe the disc from the center out.

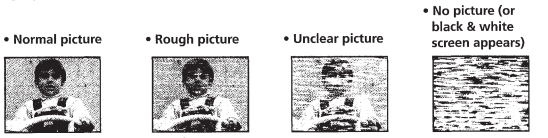
- Do not use solvents such as benzine, thinner, commercially available cleaners or anti-static spray intended for vinyl LPs.

Troubleshooting

If you have any questions or problems not covered below, please consult your nearest Sony service facility.

	Symptom	Remedy
Power	The ON/STANDBY switch does not function.	• Connect the mains lead securely.
	The power is turned on but this unit does not operate.	• Moisture condensation occurred. Turn the power off, unplug the mains lead and leave this unit to dry for over an hour. • There's no disc inside the VCD part ("no dISC" appears). Insert a disc. • Insert the disc with the label side up on the disc tray of the VCD part correctly. • Clean the disc (VIDEO CD or Audio CD).
Playback	The playback picture does not appear on the TV screen.	• Make sure the TV is set to the video channel. If you are using a monitor, set it to video input. • Check that the unit is connected securely. • Make sure you set the COLOR SYSTEM switch correctly, according to your TV.
	The picture is not clear.	• Adjust the tracking with the ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST buttons when using a video tape. • Make sure the COLOR SYSTEM switch is set to the position corresponding to the colour system which the tape was recorded with. • The video heads of VHS part are dirty (see below). Clean the video heads using the Sony T-25CLD, E-25CLDR, or T-25CLW video head cleaning cassettes. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony service facility (a standard service fee will be charged). Do not use a commercially available liquid-type cleaning cassette other than Sony's, as it may damage the video heads. • The video heads of VHS part may have to be replaced. Consult your local Sony service facility for more information.

Symptoms caused by contaminated video heads of VHS part



continued

Troubleshooting (continued)

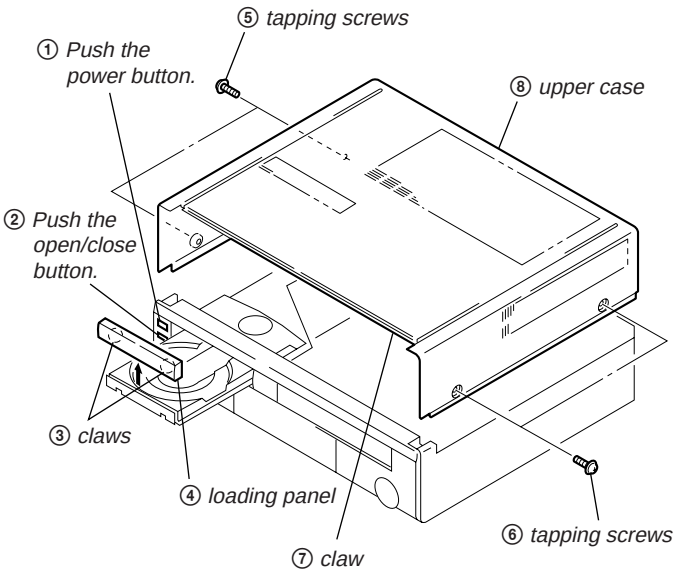
	Symptom	Remedy
Playback	The picture rolls vertically during picture search.	• Adjust the vertical hold control on the TV or monitor.
	The picture has no sound	• The tape is defective. Use a new tape. • Check that the unit is connected securely. • Make sure you operate the TV or the amplifier correctly. • Make sure you select the correct position on the amplifier.
	The sound is unstable or has an echo.	• When you play a tape with the same sound recorded on both the hi-fi and normal sound tracks, make sure the AUDIO MIX option in SET UP VHS is set to OFF.
	The sound loses stereo effect.	• If "R ch" or "L ch" appears in the display window, press AUDIO MONITOR repeatedly to display "STEREO" in the display window.
	The unit doesn't play from the first track when playing a VIDEO CD without PBC functions or an audio CD.	• Press CONTINUE. "CONTINUE" appears in the display window, then press ▷ PLAY.
Recording	The tape starts playing as soon as it is inserted.	• The safety tab of the video tape has been removed. To record on this tape, cover the tab hole.
	The tape is ejected when you press ● REC.	• Check that the safety tab of the video tape has not been removed.
	Nothing happens when you press ● REC.	• Make sure the tape is not at its end. • Select the correct source with the INPUT SELECT buttons.
Clock	The clock has stopped and "–:–" lights in the display window.	• The clock stops if the unit is disconnected from the mains for more than an hour. Reset the clock (and timer).
Timer recording	The timer does not operate.	• Check that the clock is set. • Make sure a tape has been inserted. • Check that the safety tab has not been removed. • Make sure the tape is not at its end. • Make sure a programme has been set for timer recording. • Make sure your timer settings have not already passed the current time. • The clock stops if the unit is disconnected from the mains for more than an hour. Reset the clock and timer.

	Symptom	Remedy
Others	No tape can be inserted.	• Check that a tape isn't already in the tape compartment of the VHS part.
	The remote commander does not function.	• Make sure you are pointing the remote commander at the remote sensor on the unit. • Remove the obstacles in the path of the remote commander and the unit. • Replace all the batteries in the remote commander with new ones if they are weak. • Make sure the [TV]/[VCD/VHS] remote control switch is set correctly.
	The M indicator does not appear on the screen.	• The recording condition of the tape is very poor and tracking cannot be adjusted in the VHS part, or the NTSC system is being used.
	The unit needs to be cleaned.	• Clean the cabinet, panel, and controls with a dry soft cloth, or a soft cloth slightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine.
	The AMS function does not work properly in the KARAOKE mode.	• The tape has too many blank spaces in a short time span.
	The sound from the microphone does not go out in the KARAOKE mode.	• When the unit is in stop mode, the sound from the microphone may not go out. To listen to the sound in stop mode, press INPUT SELECT 2 (page 42).

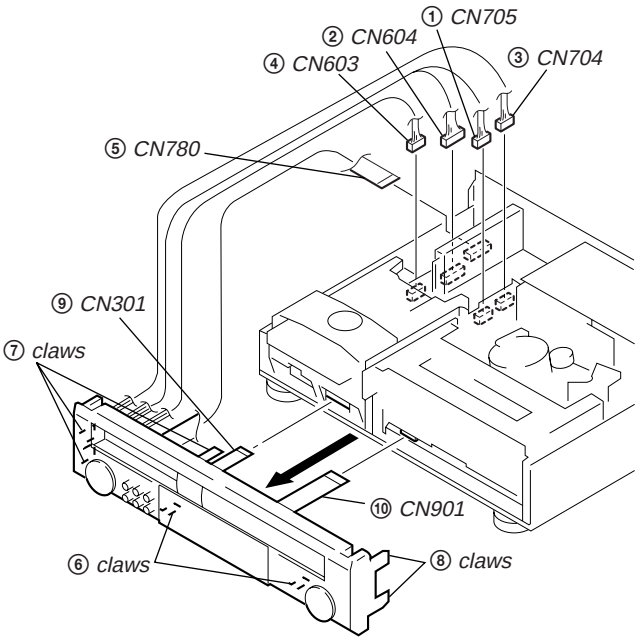
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

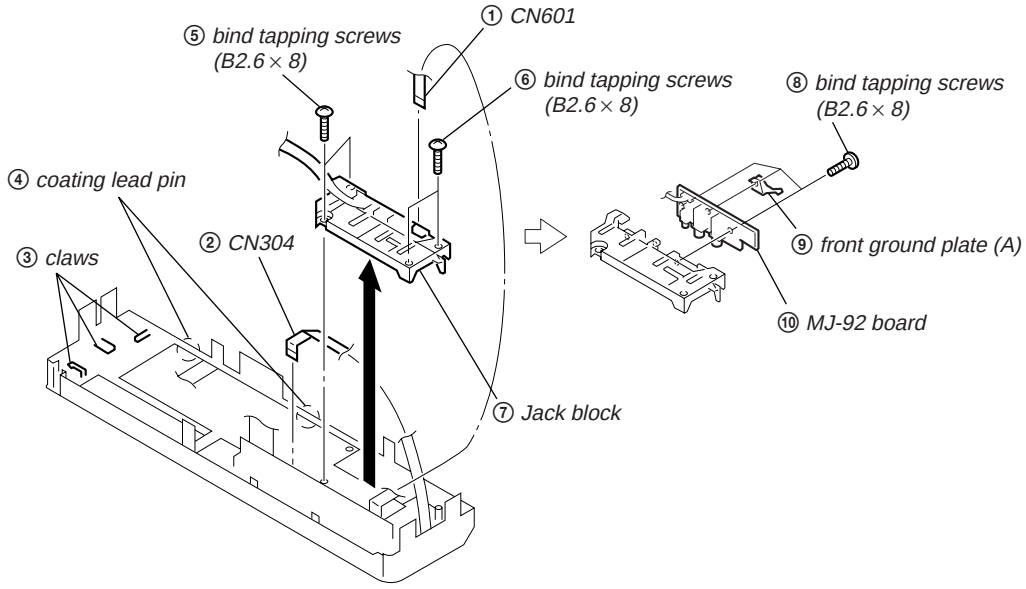
2-1. UPPER CASE



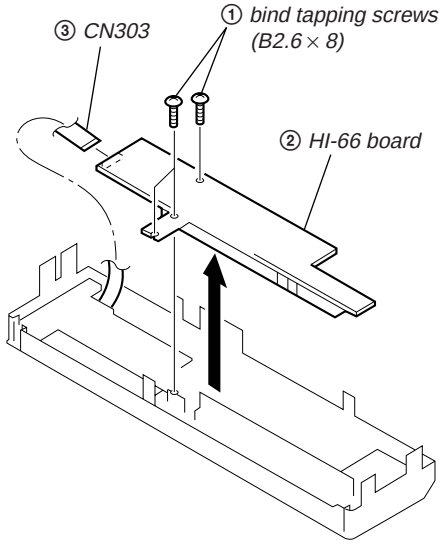
2-2. FRONT PANEL ASSY



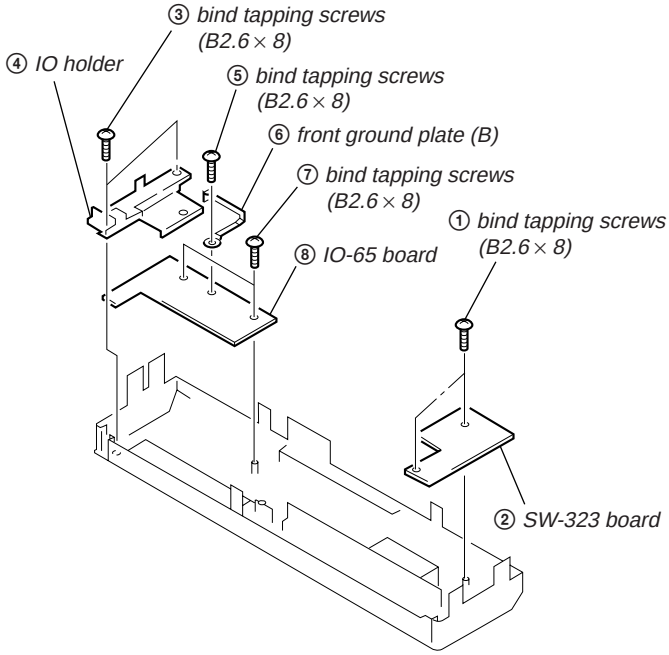
2-3. JACK BLOCK, MJ-92 BOARD


⑤ bind tapping screws (B2.6 × 8)
① CN601
⑥ bind tapping screws (B2.6 × 8)
⑧ bind tapping screws (B2.6 × 8)
④ coating lead pin
② CN304
③ claws
⑨ front ground plate (A)
⑩ MJ-92 board
⑦ Jack block

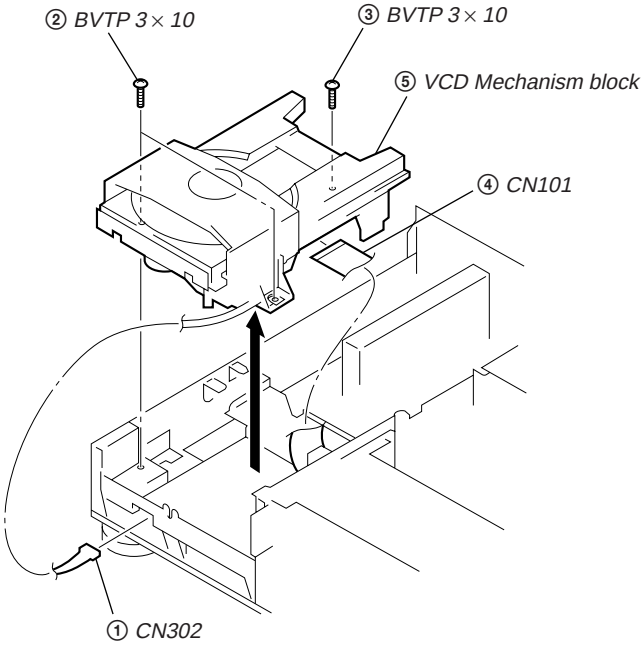
2-4. HI-66 BOARD



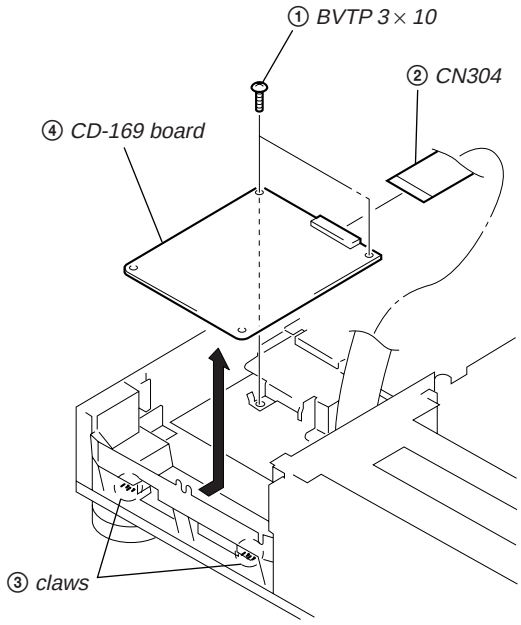
2-5. SW-323 BOARD, IO-65 BOARD


③ bind tapping screws (B2.6 × 8)
④ IO holder
⑤ bind tapping screws (B2.6 × 8)
⑥ front ground plate (B)
⑦ bind tapping screws (B2.6 × 8)
① bind tapping screws (B2.6 × 8)
⑧ IO-65 board
② SW-323 board

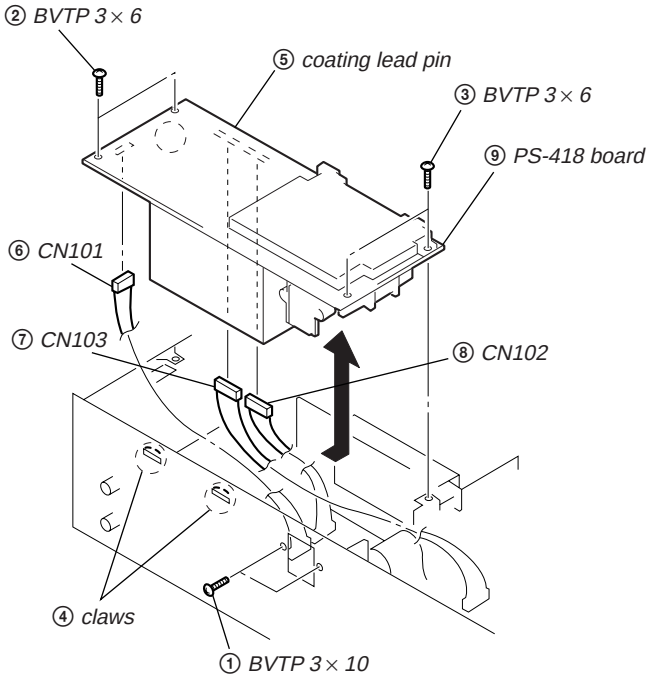
2-6. VCD MECHANISM BLOCK



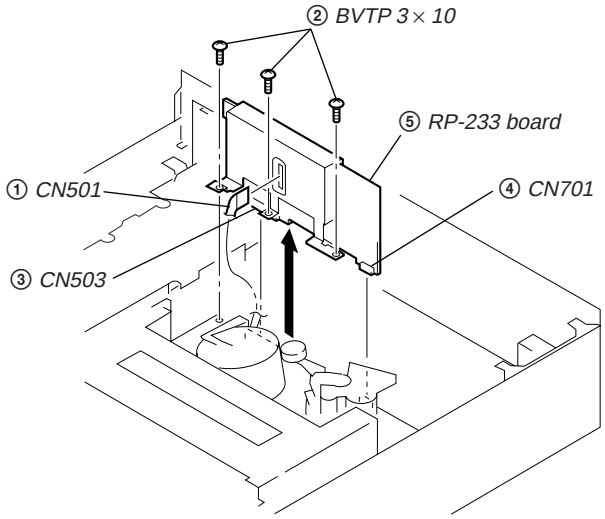
2-7. CD-169 BOARD



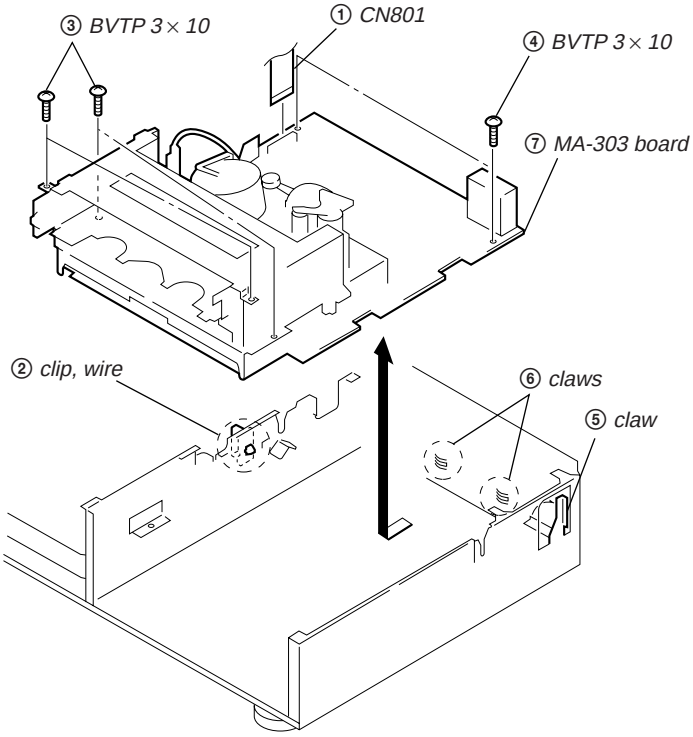
2-8. PS-418 BOARD



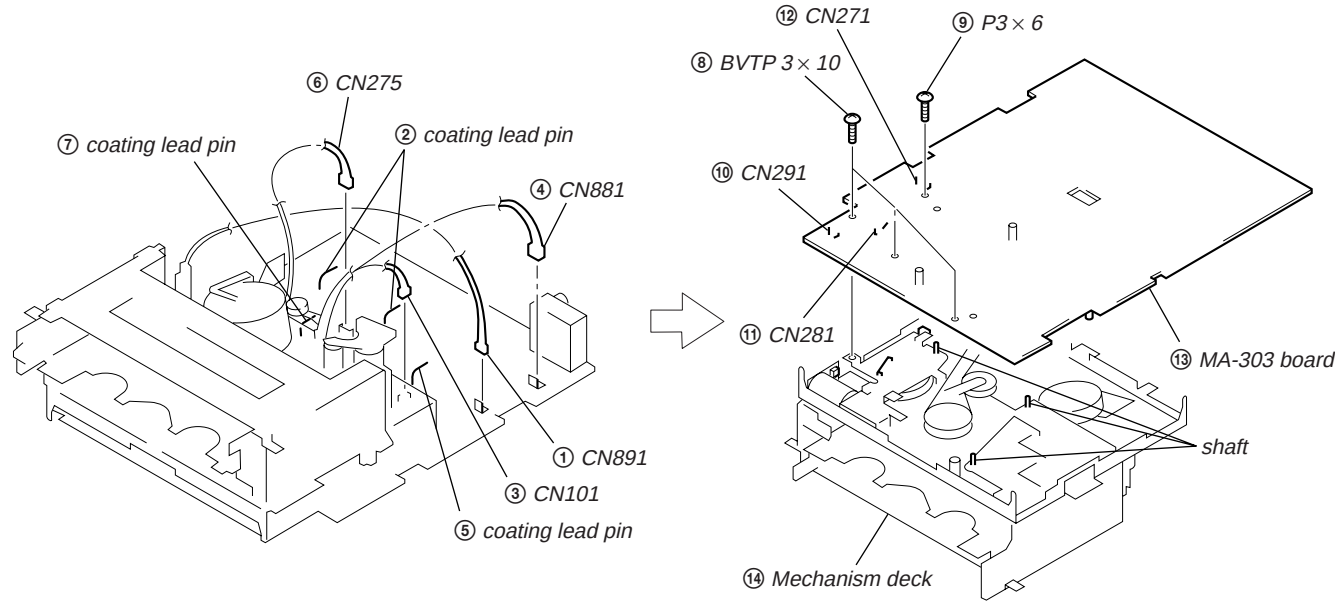
2-9. RP-233 BOARD



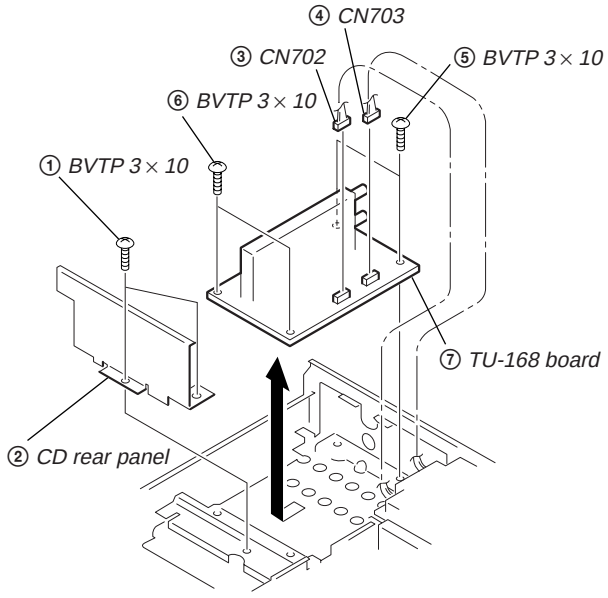
2-10. MA-303 BOARD



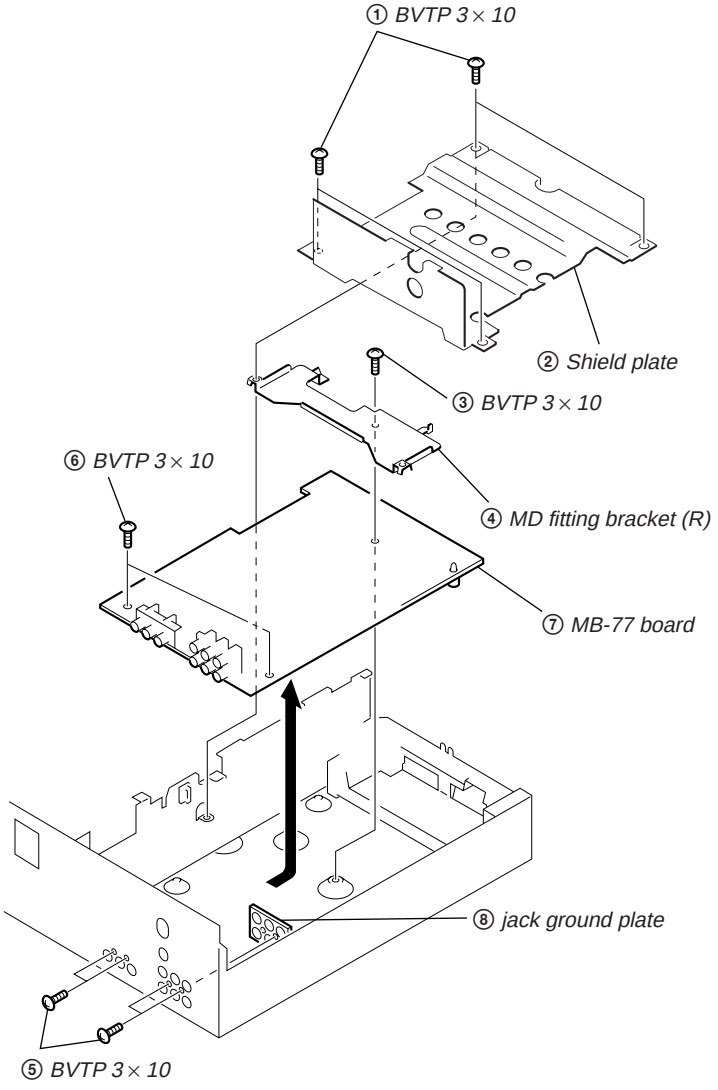
2-11. MECHANISM DECK



2-12. TU-168 BOARD

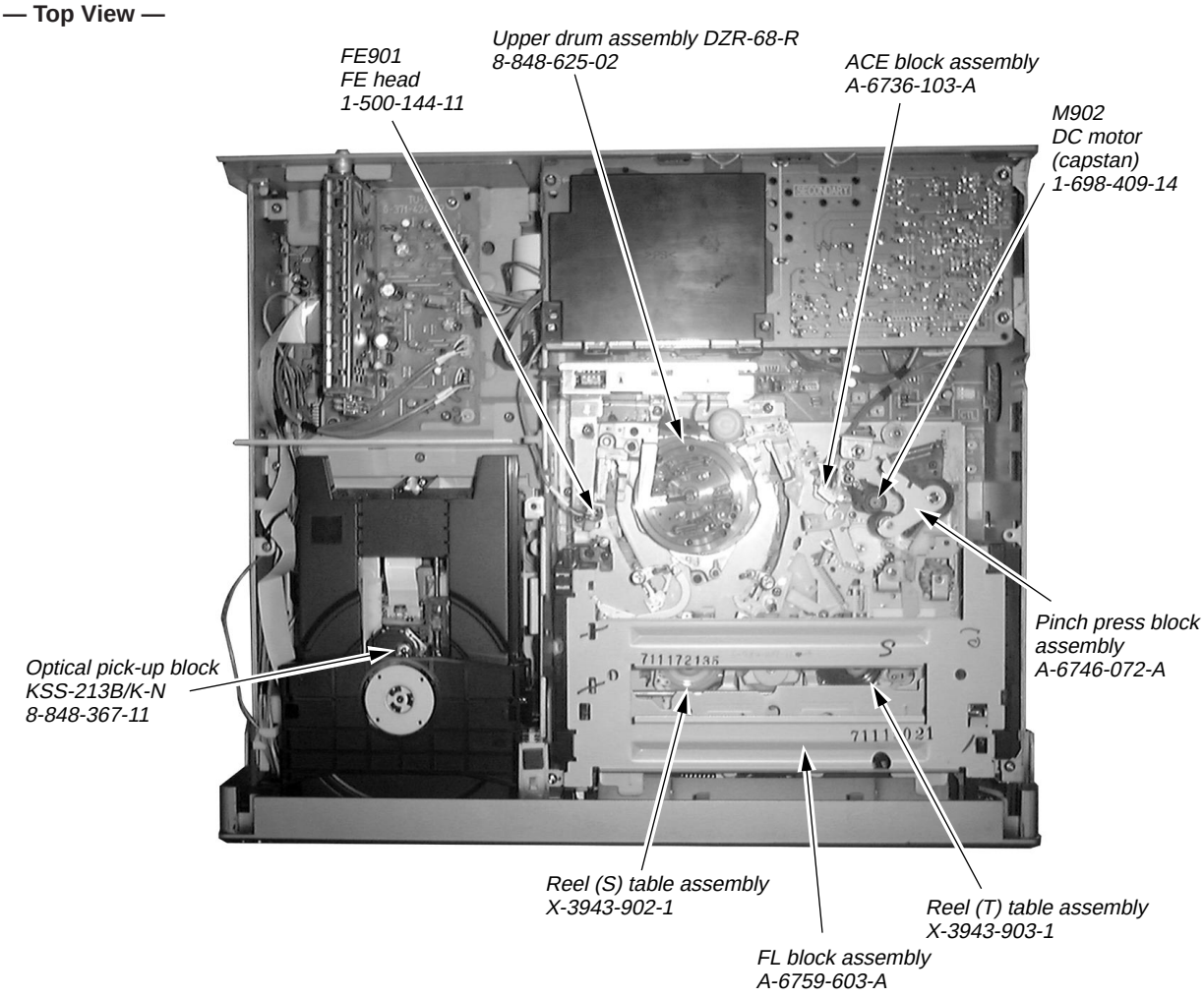


2-13. MB-77 BOARD

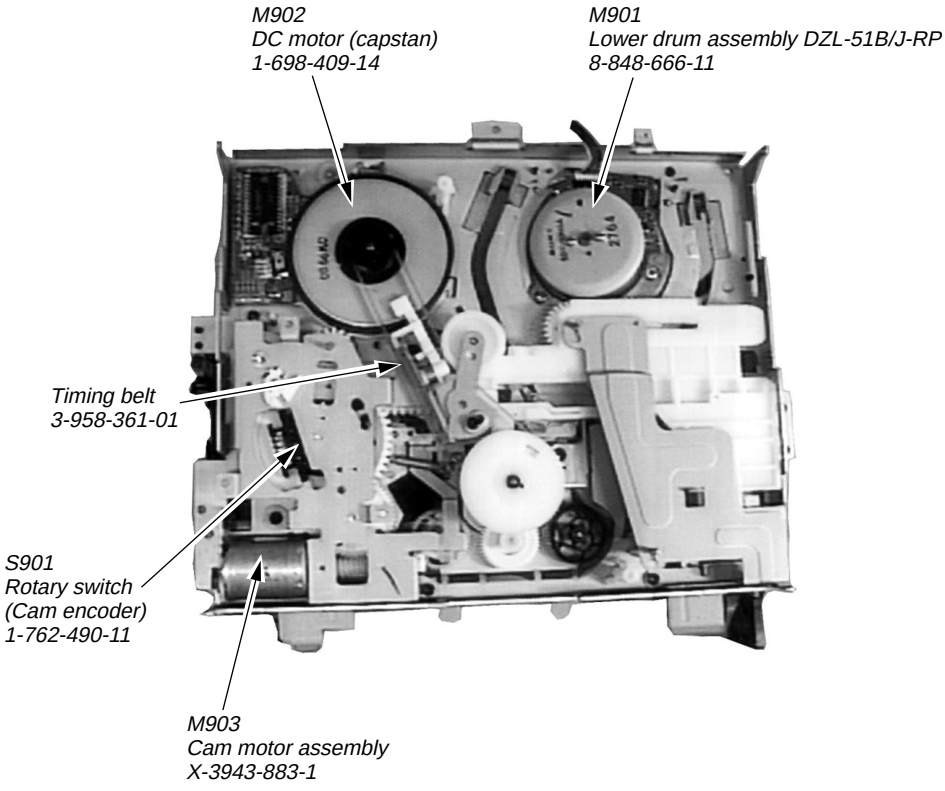


2-14. INTERNAL VIEWS

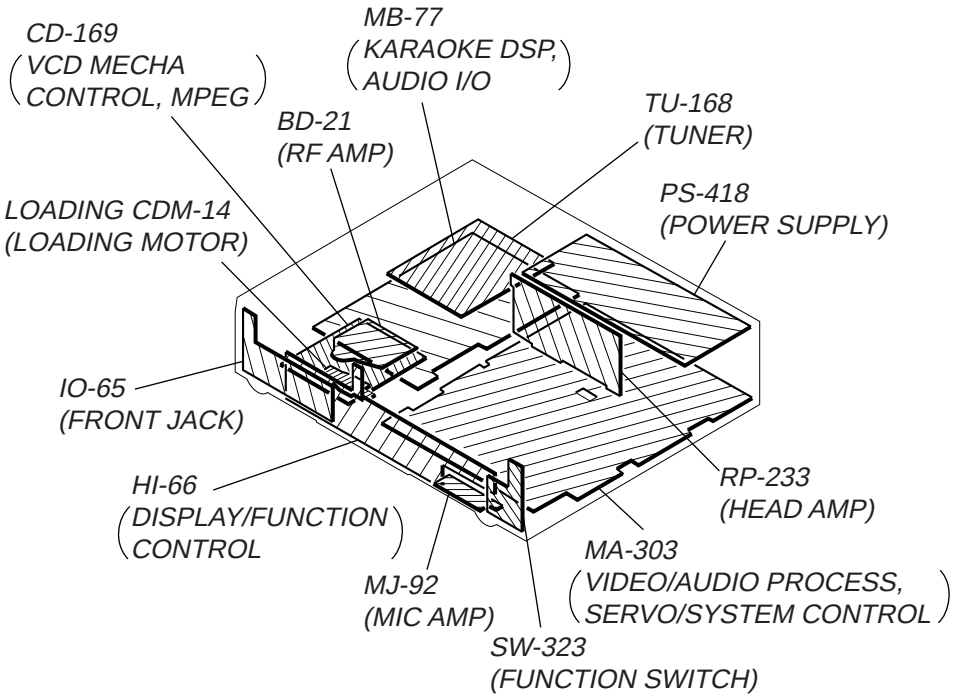
— Top View —

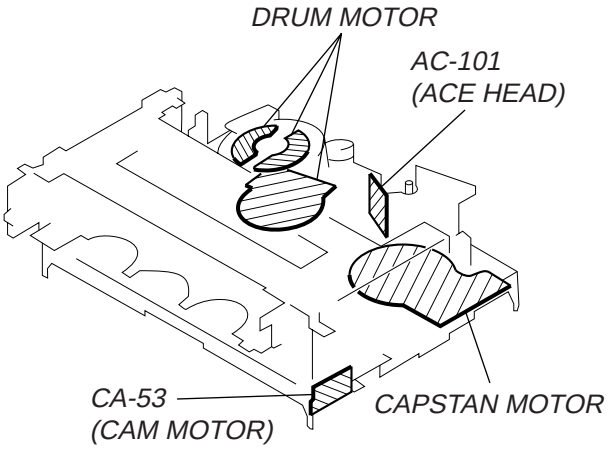


— Bottom View —



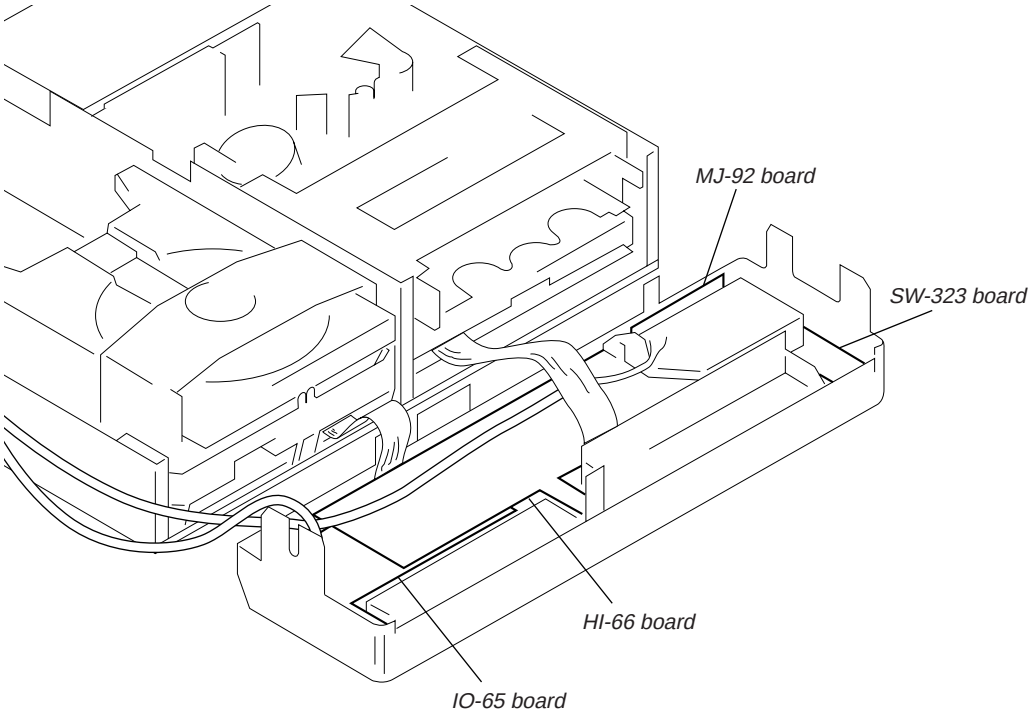
2-15. CIRCUIT BOARDS LOCATION



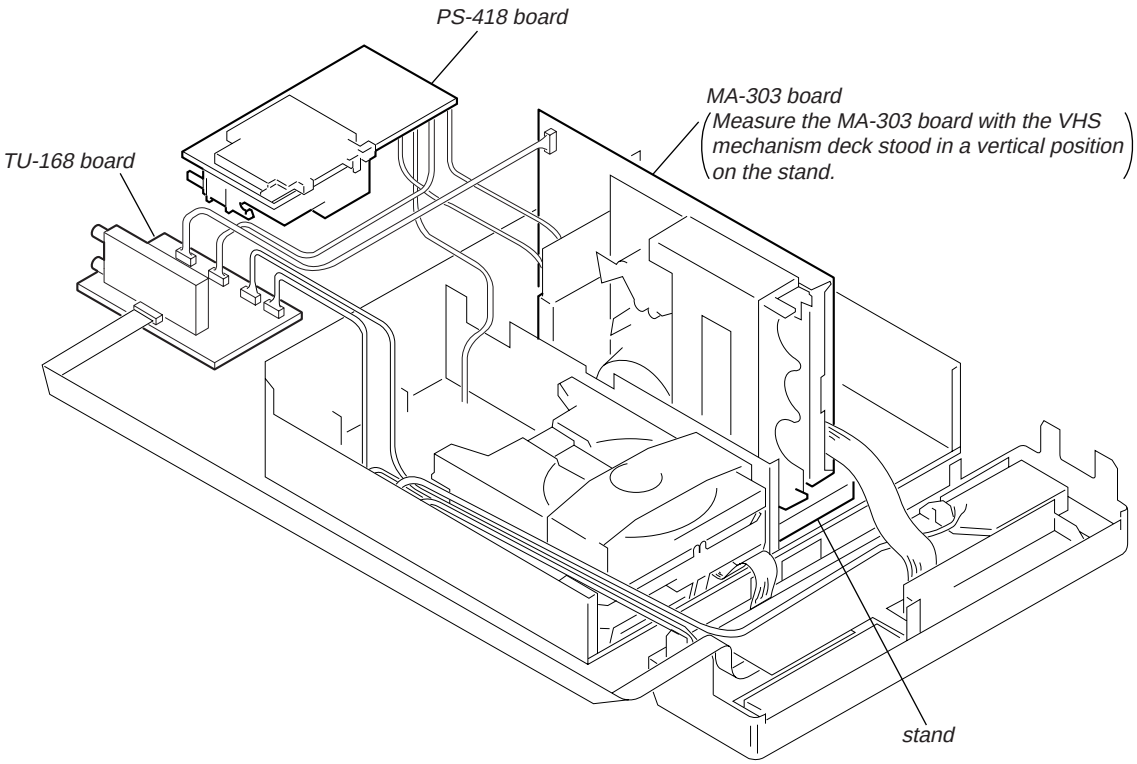


SECTION 3
SERVICE POSITION

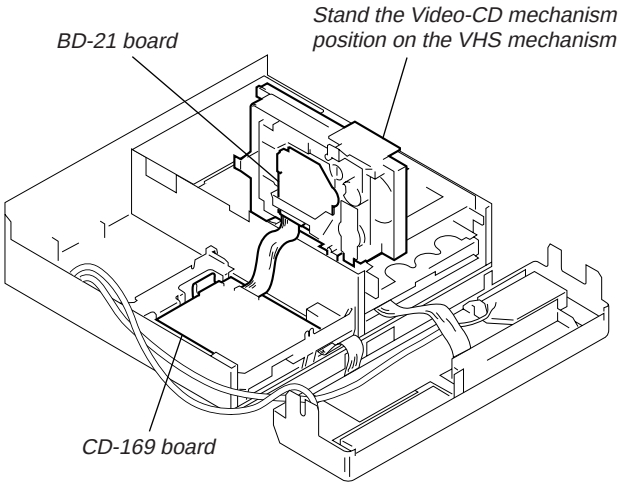
3-1. HI-66, IO-65, SW-323 AND MJ-92 BOARDS



3-2. MA-303, TU-168 AND PS-418 BOARDS


PS-418 board
MA-303 board
Measure the MA-303 board with the VHS mechanism deck stood in a vertical position on the stand.
TU-168 board
stand

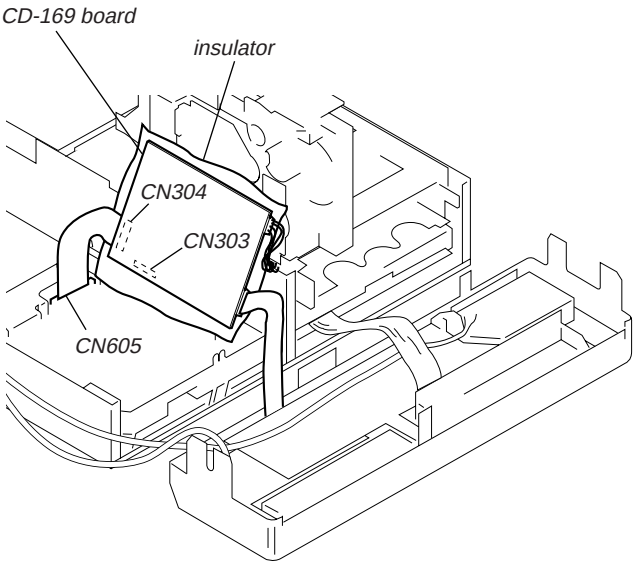
3-3. CD-169 AND BD-21 BOARDS



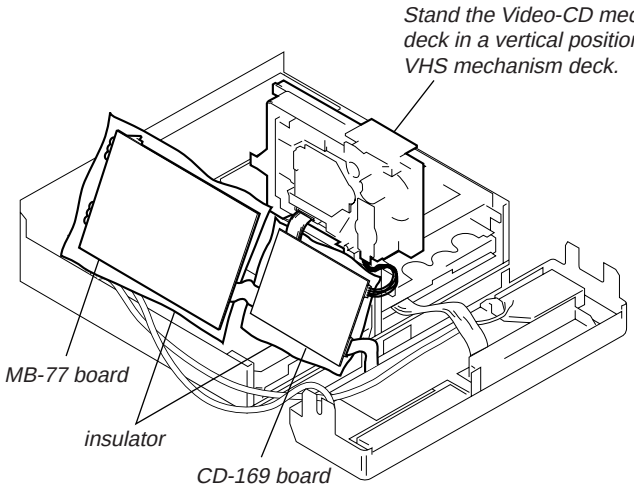
* *When measuring the B side of CD-169 board*

(When the Video-CD mechanism board is normal and the CD-169 board is measured singly.)

① *Replace the flat cable between CD-169 board CN304 and MB-77 board CN605 with the flat cable between CD-169 board CN303 and BD-21 board CN101. (CD-169 board CN303 and BD-21 board CN101 are left open.)*

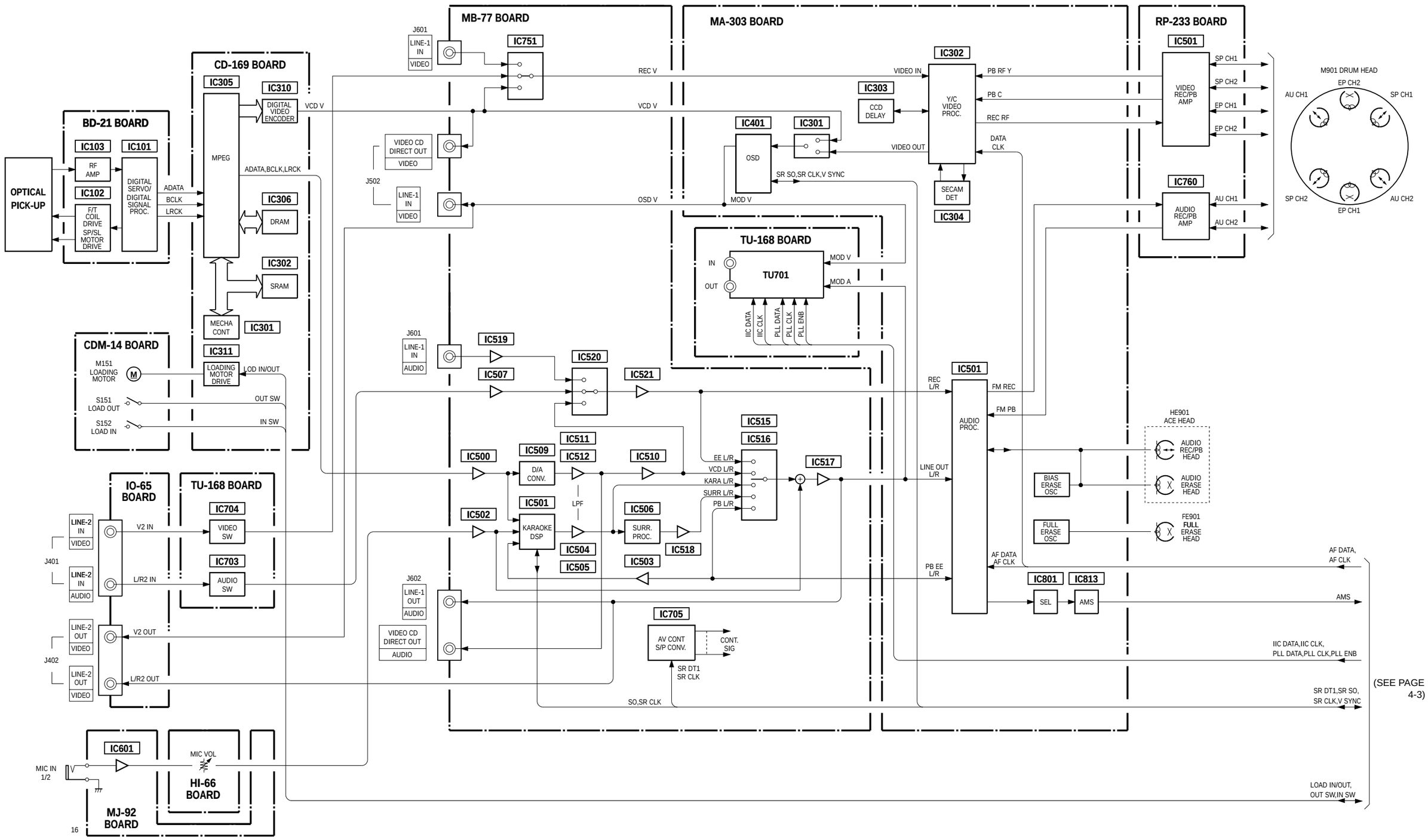


3-4. MB-77 BOARD



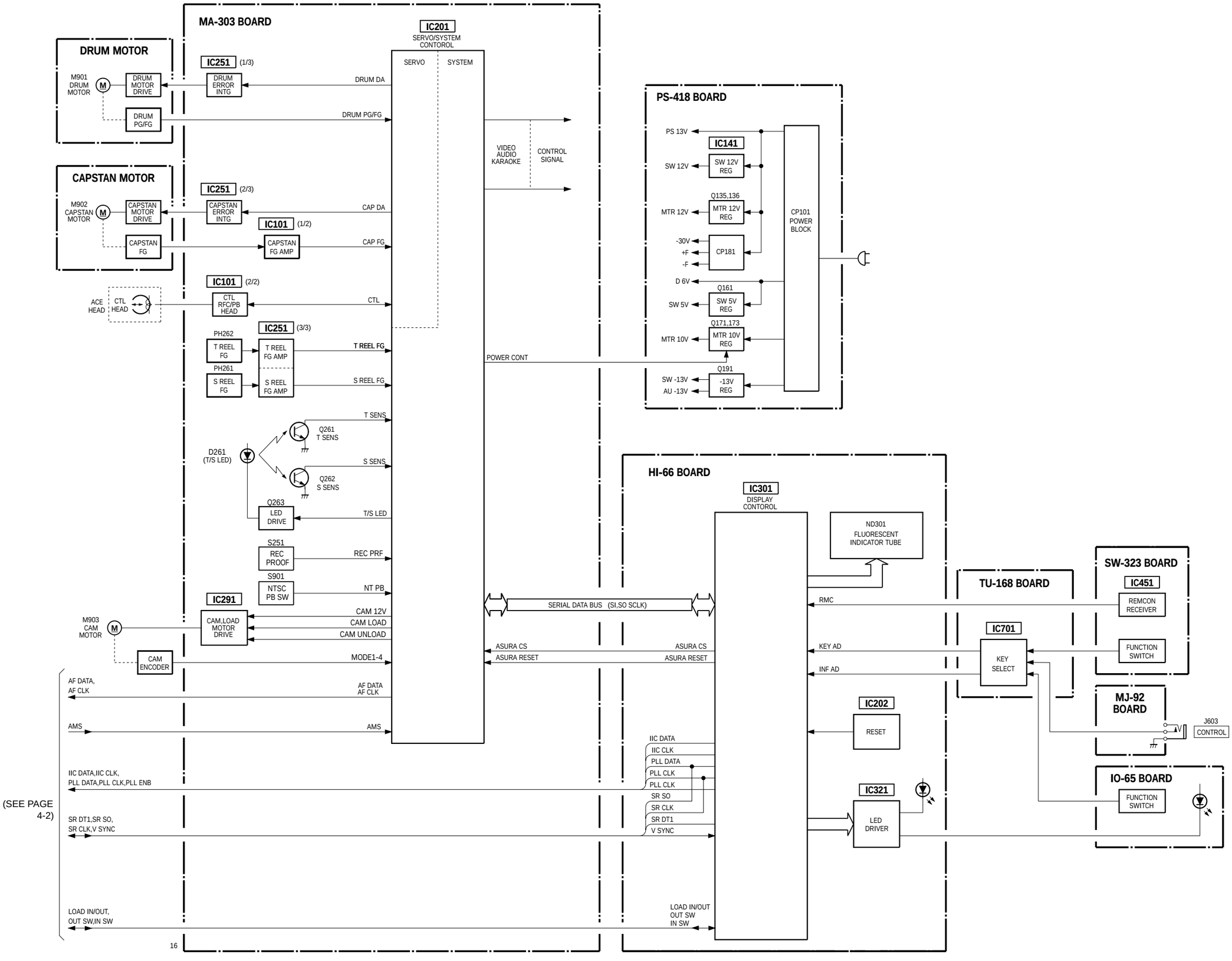
SECTION 4
BLOCK DIAGRAMS

4-1. OVERALL BLOCK DIAGRAM (1/2)

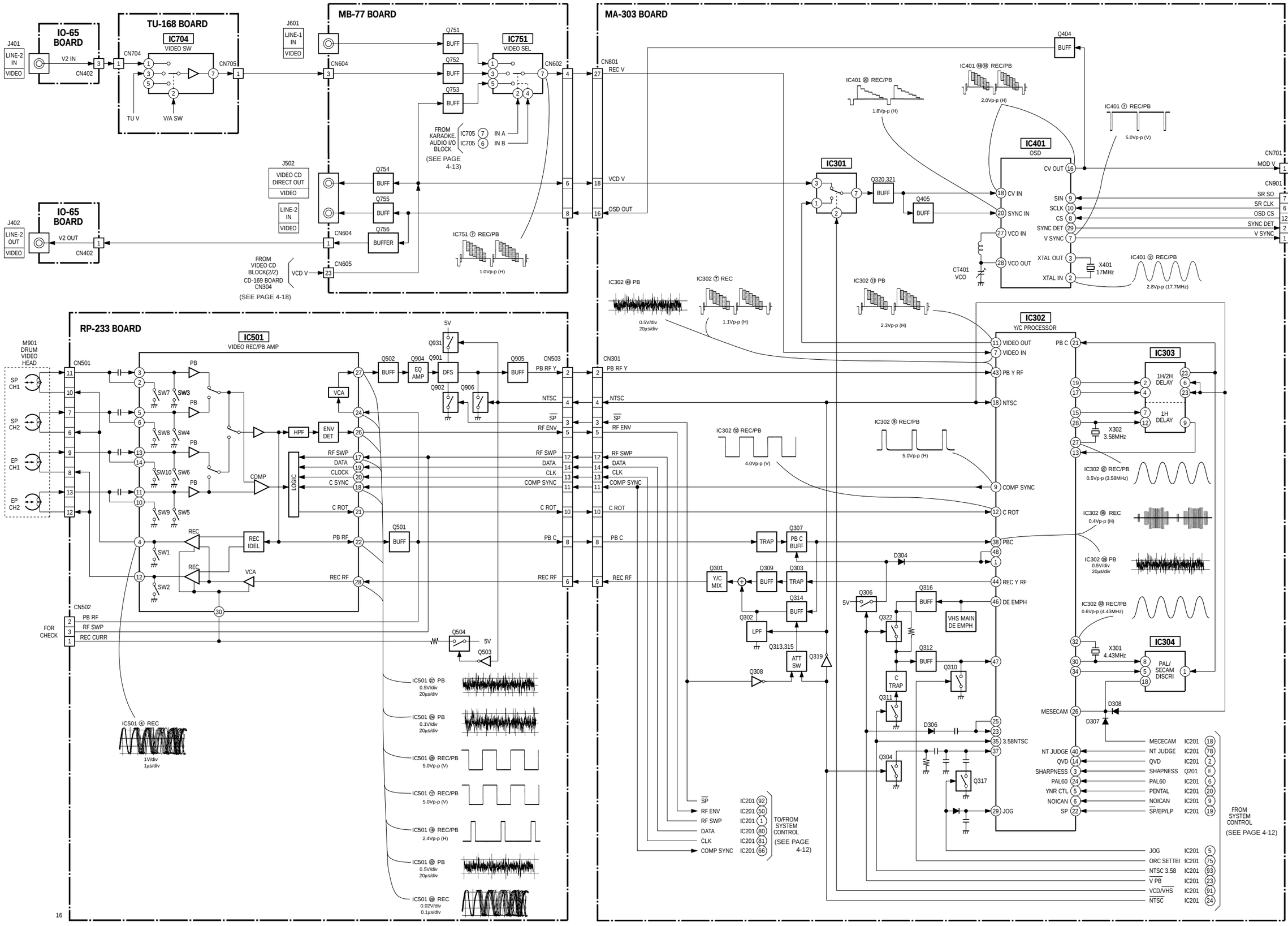


(SEE PAGE 4-3)

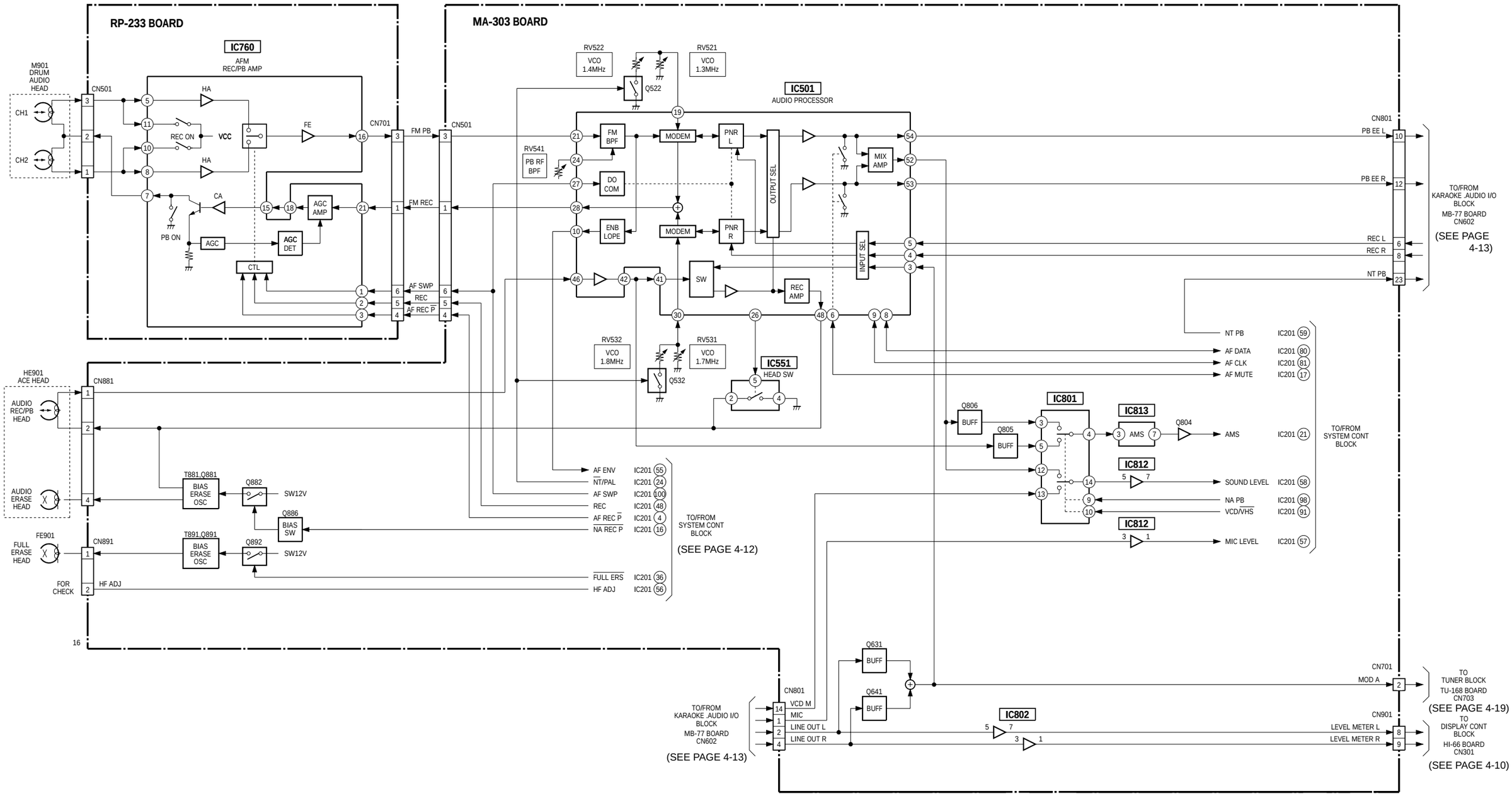
4-2. OVERALL BLOCK DIAGRAM (2/2)



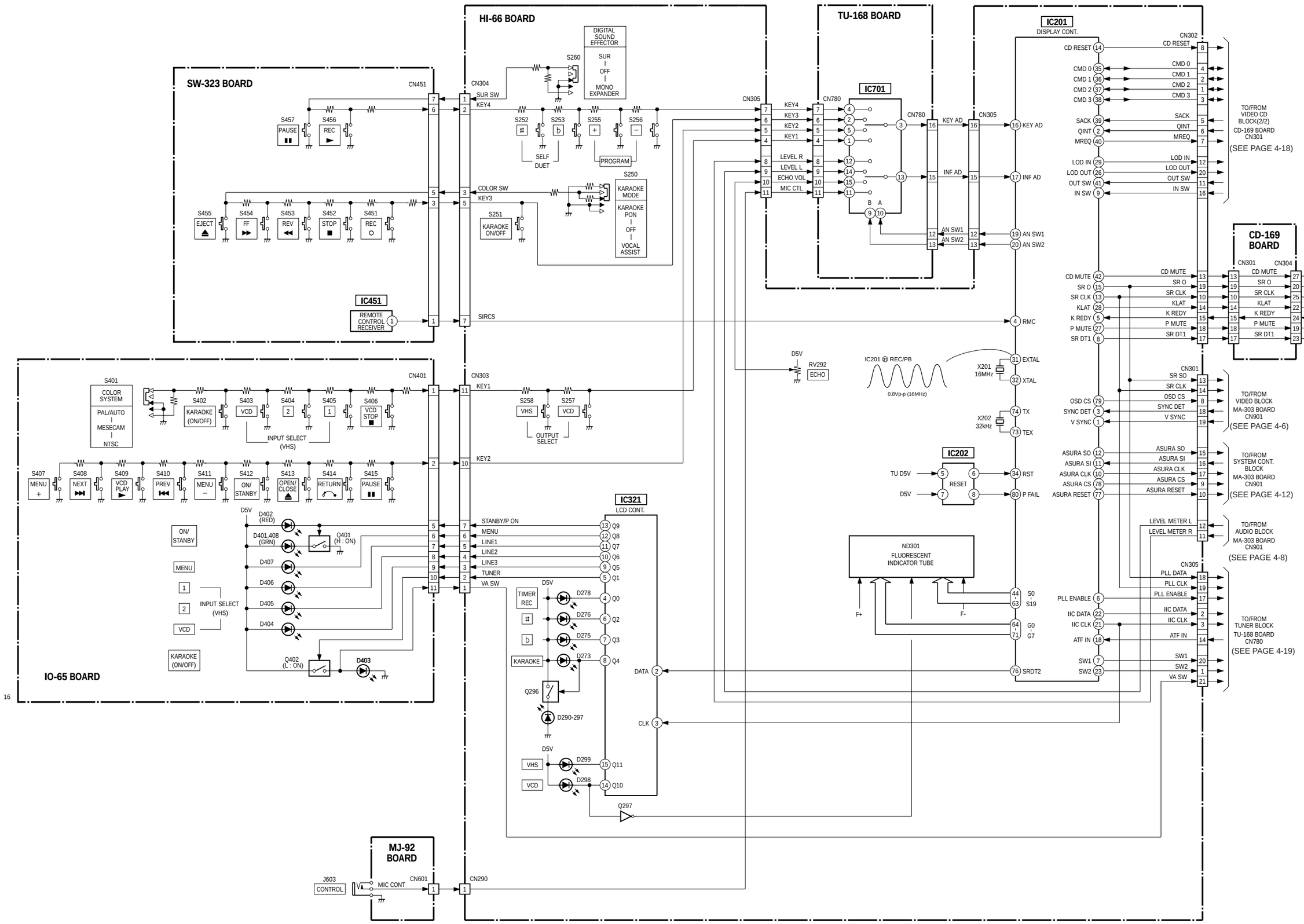
4-3. VIDEO BLOCK DIAGRAM



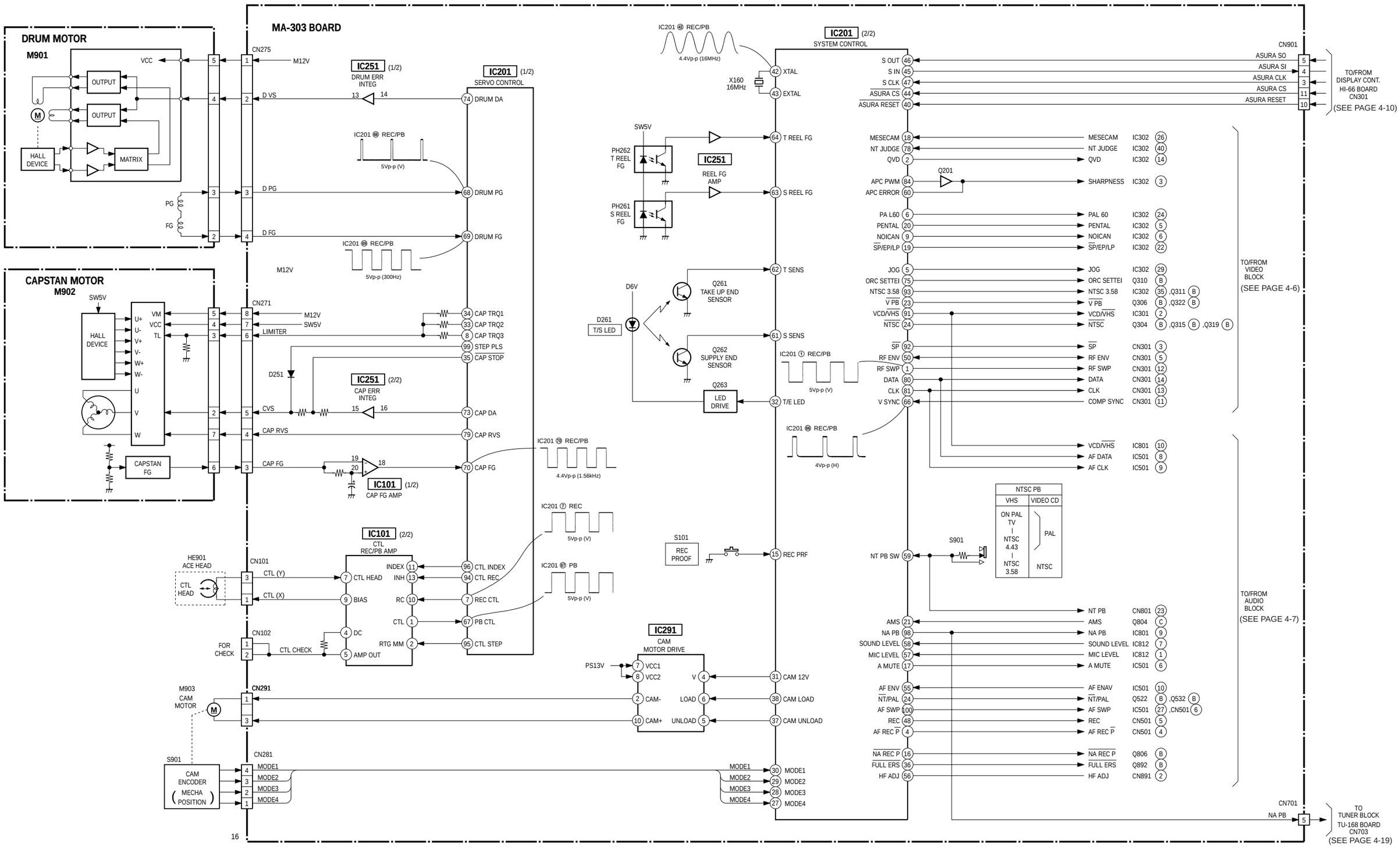
4-4. AUDIO BLOCK DIAGRAM



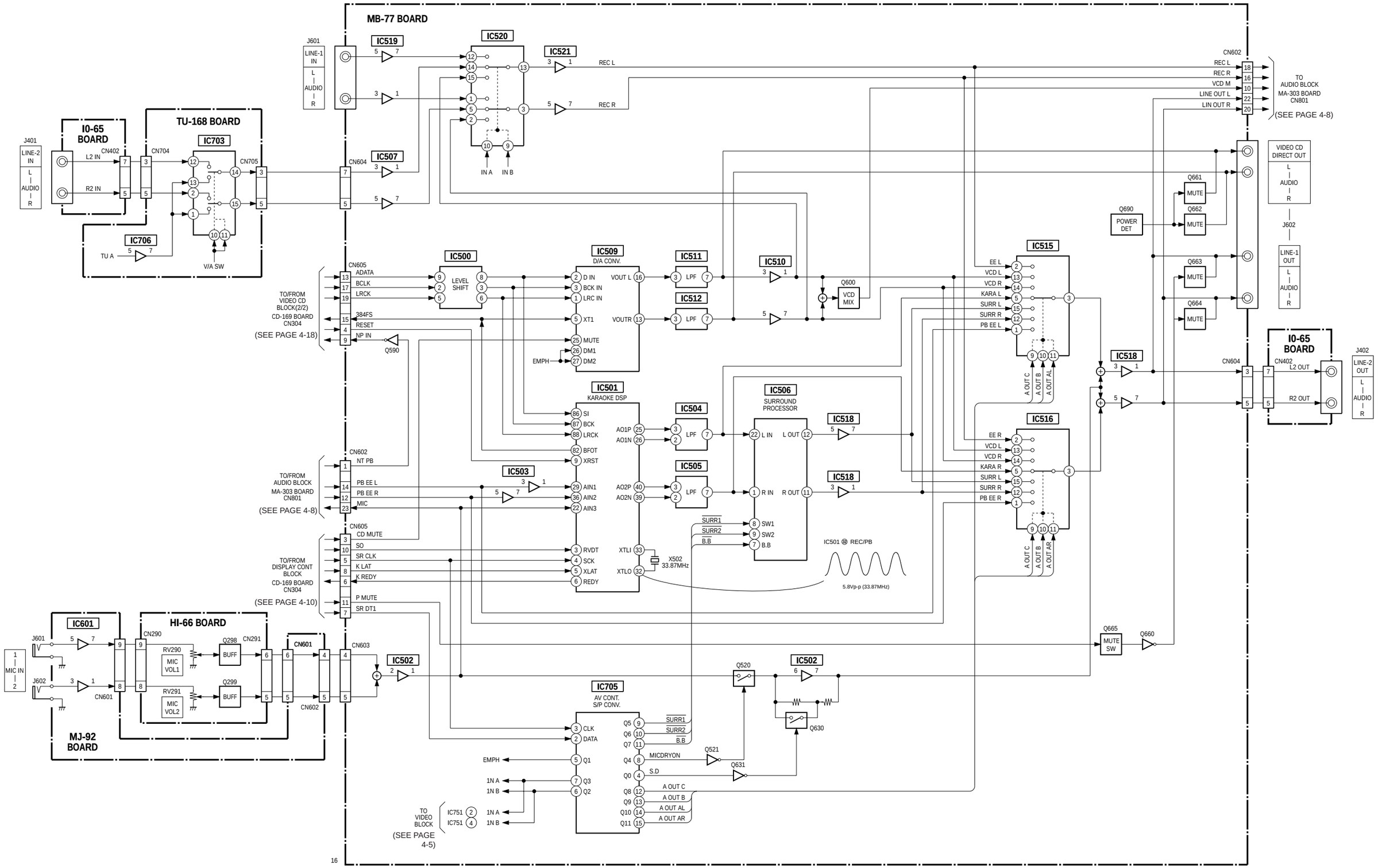
4-5. DISPLAY CONTROL BLOCK DIAGRAM



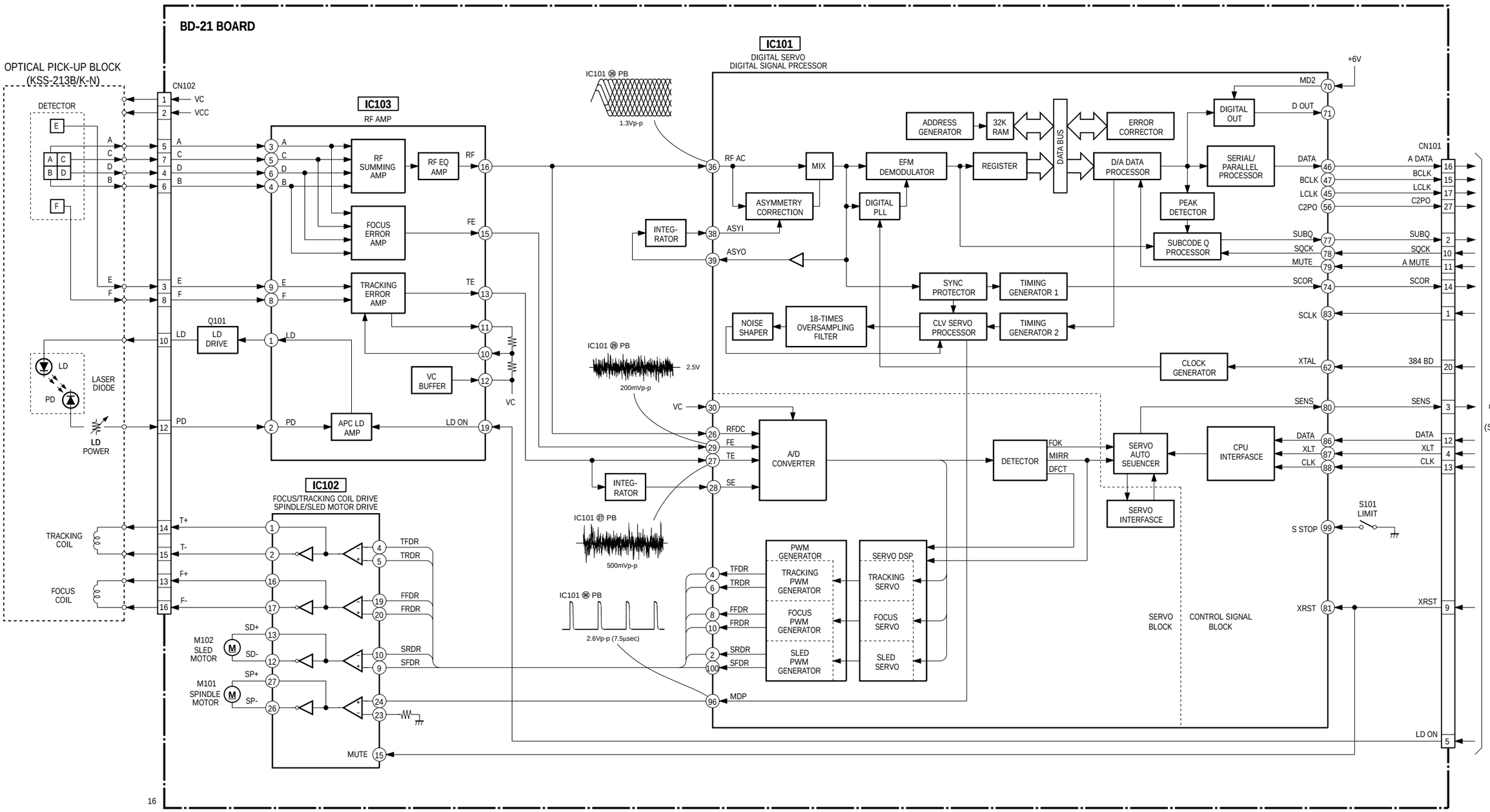
4-6. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



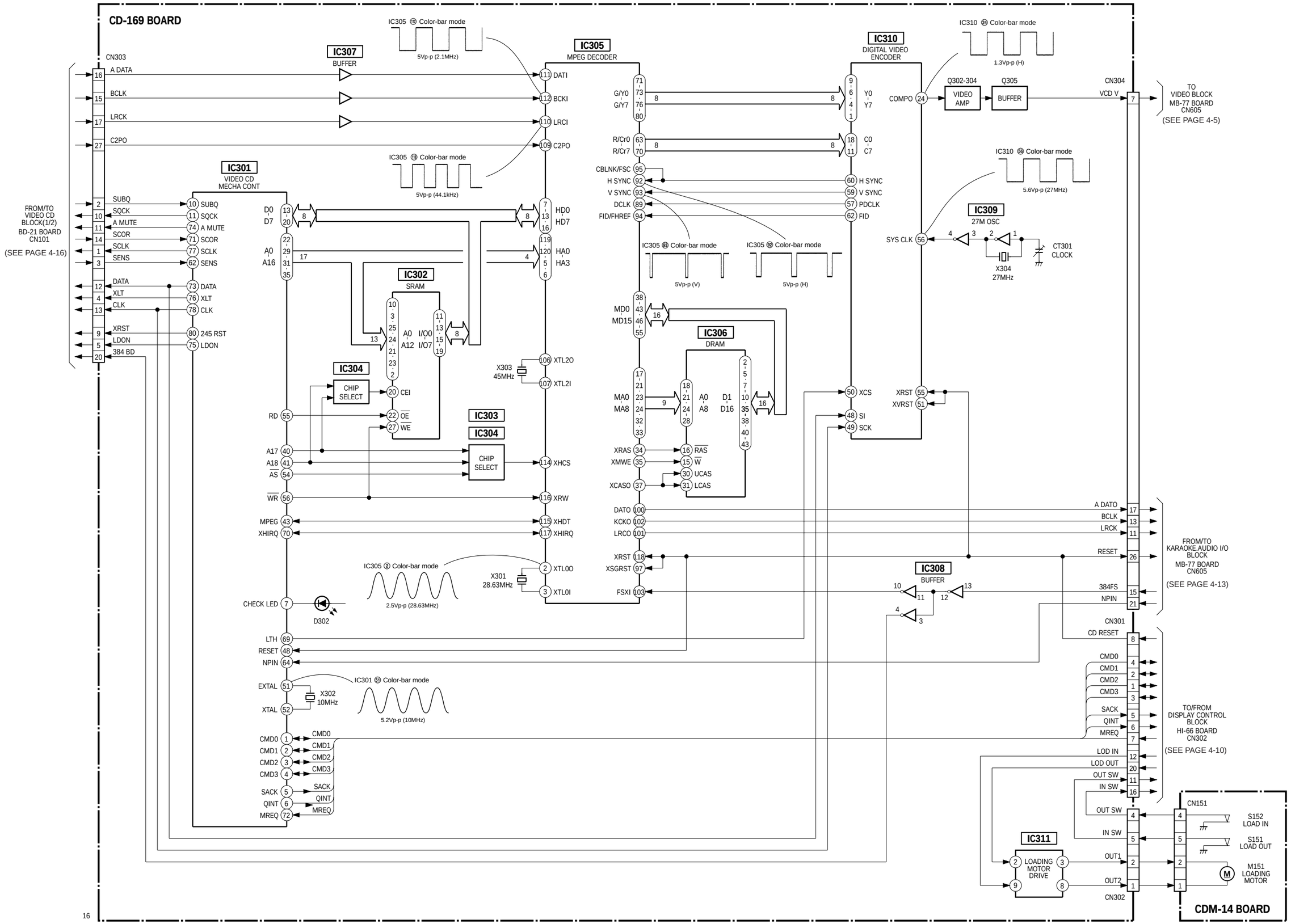
4-7. KARAOKE, AUDIO I/O BLOCK DIAGRAM



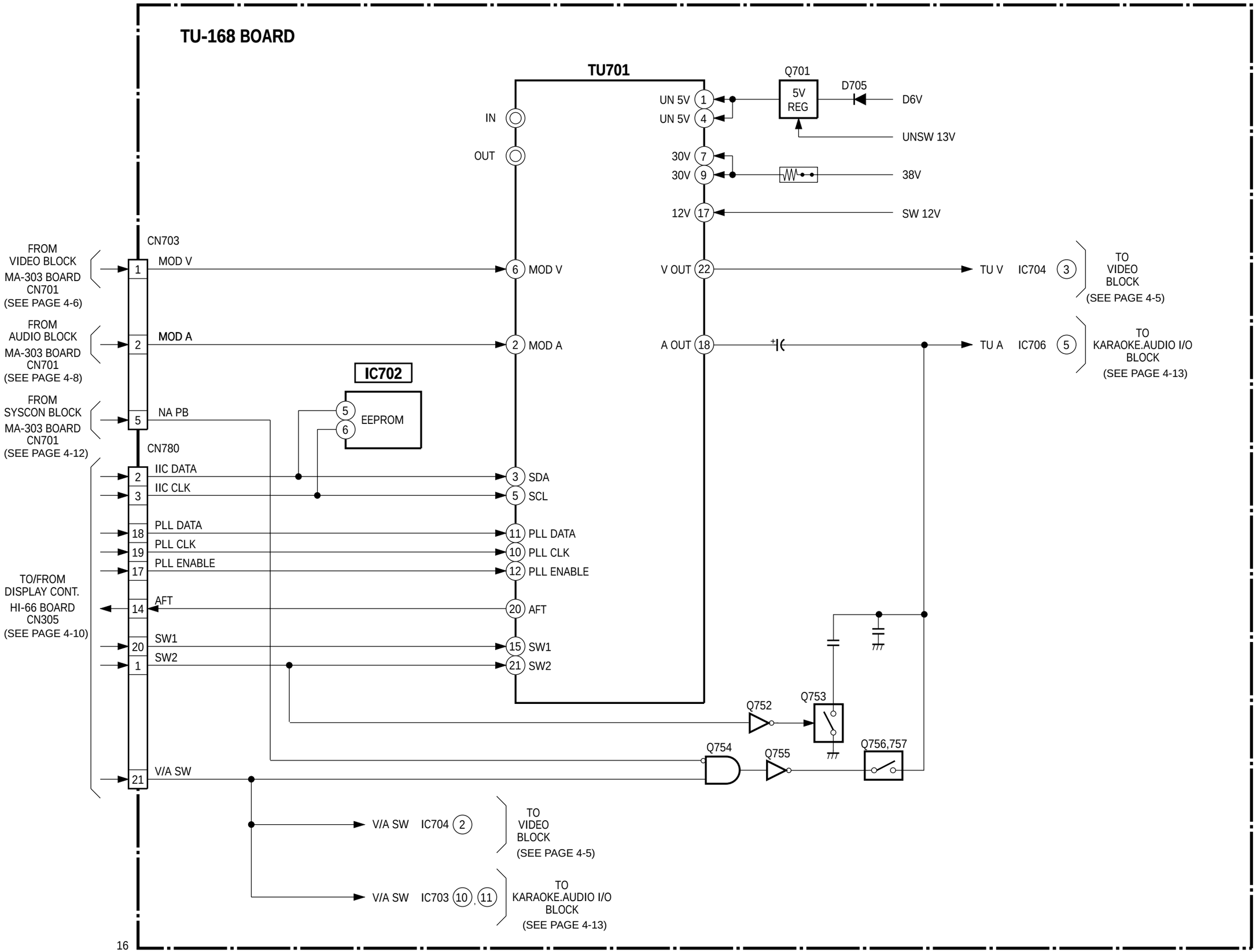
4-8. VIDEO CD BLOCK DIAGRAM (1/2)



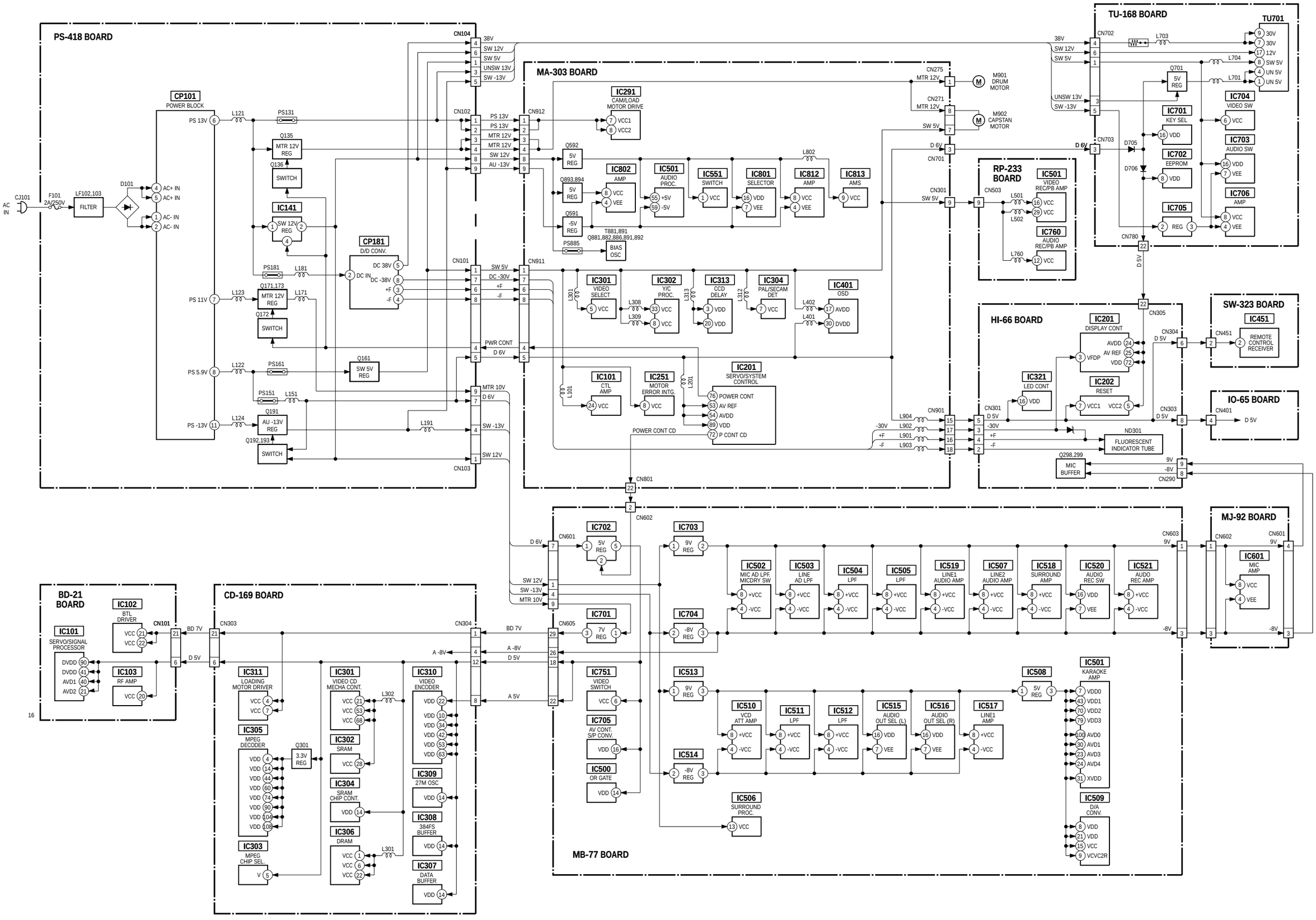
4-9. VIDEO CD BLOCK DIAGRAM (2/2)



4-10. TUNER BLOCK DIAGRAM

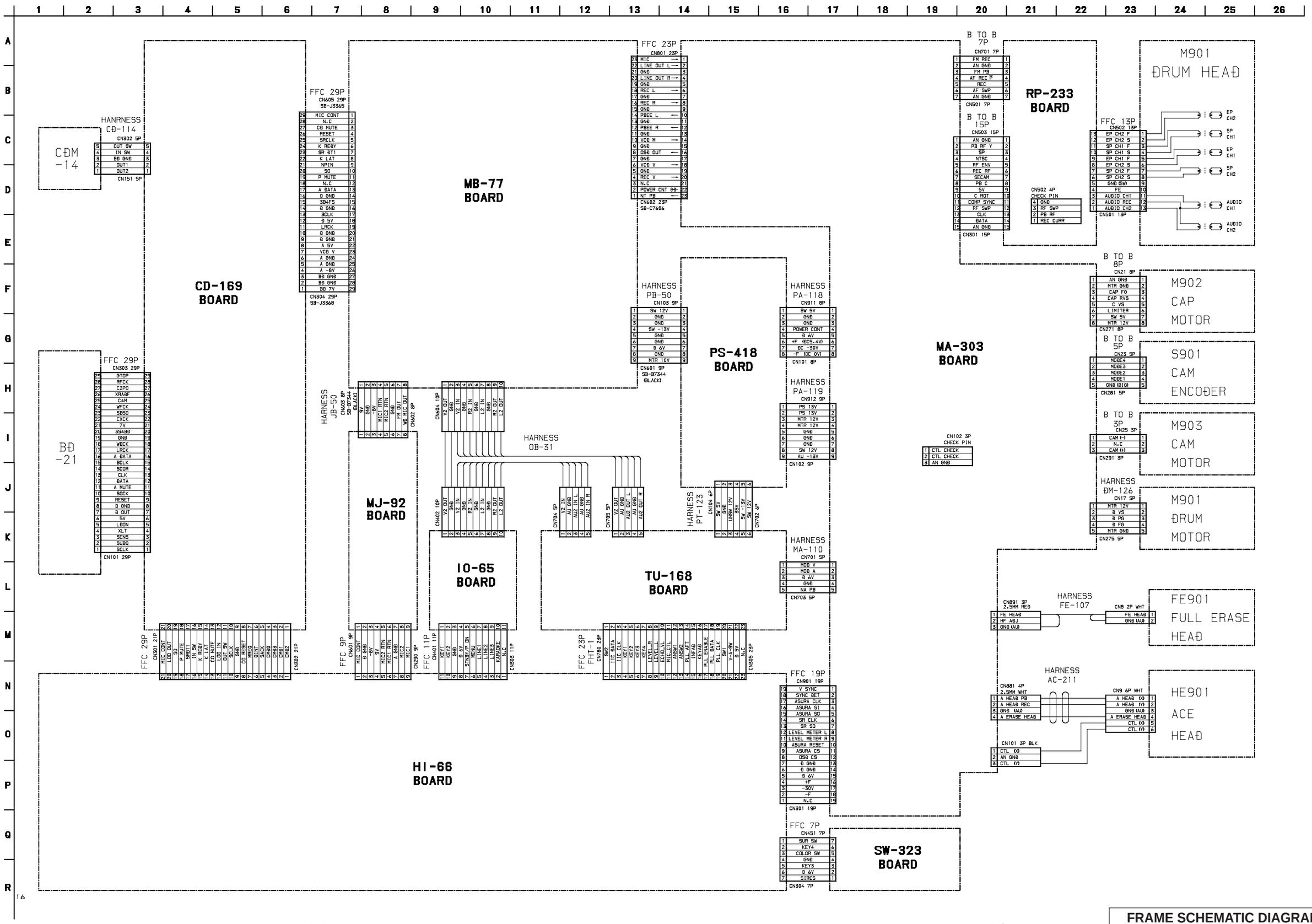


4-11. POWER BLOCK DIAGRAM



SECTION 5
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

5-1. FRAME SCHEMATIC DIAGRAM

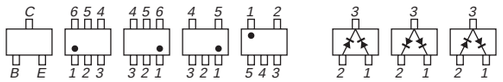


5-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR WIRING BOARDS AND SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For printed wiring boards)

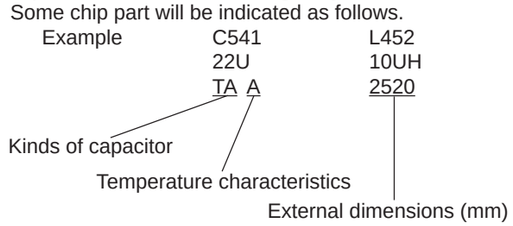
- ▒▒▒: Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.



Transistor Diode

(For schematic diagrams)

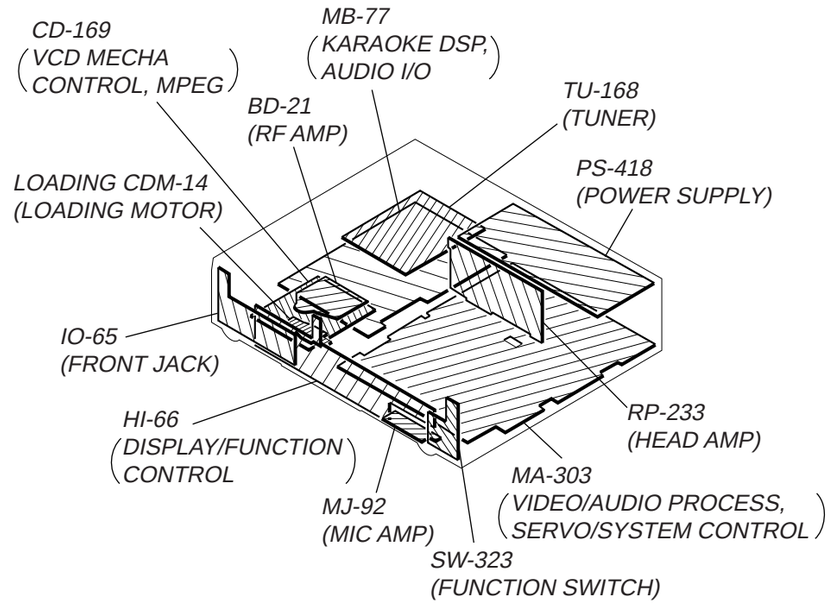
- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted. kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.

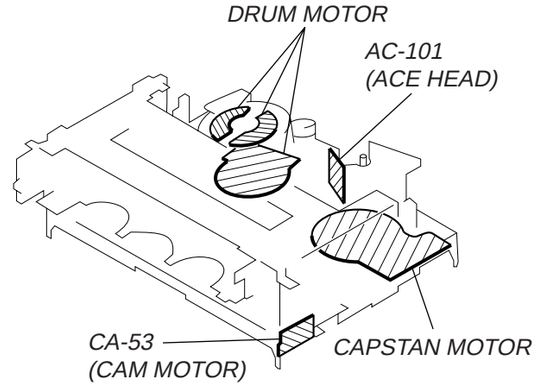


- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used. In such cases, the unused circuits may be indicated.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT → $\overline{\text{EDIT}}$ PB/XREC → PB/$\overline{\text{REC}}$
- : non flammable resistor
- : fusible resistor
- : panel designation
- B + : B+ Line
- B − : B– Line
- : adjustment for repair.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal playback.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

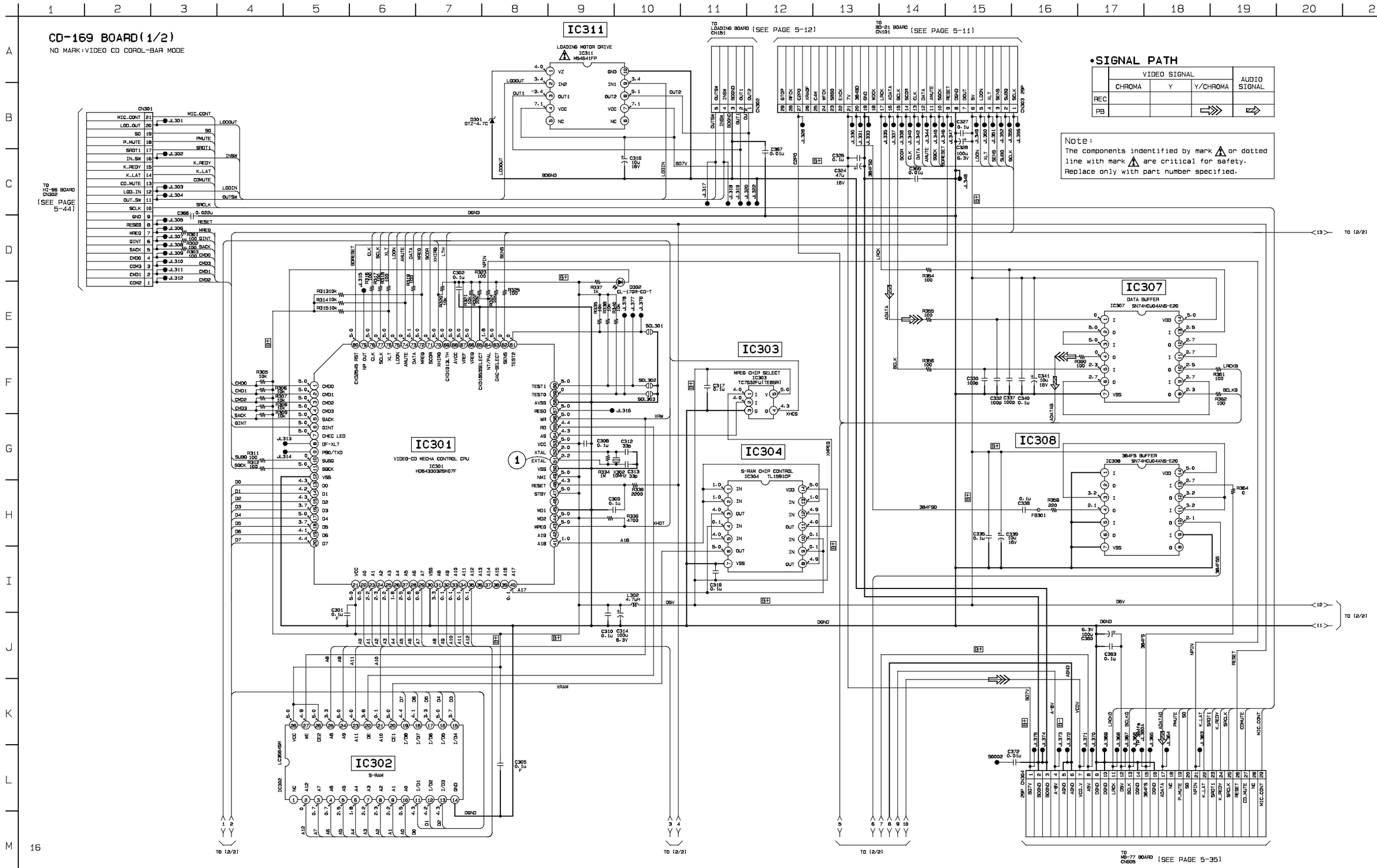
CIRCUIT BOARDS LOCATION





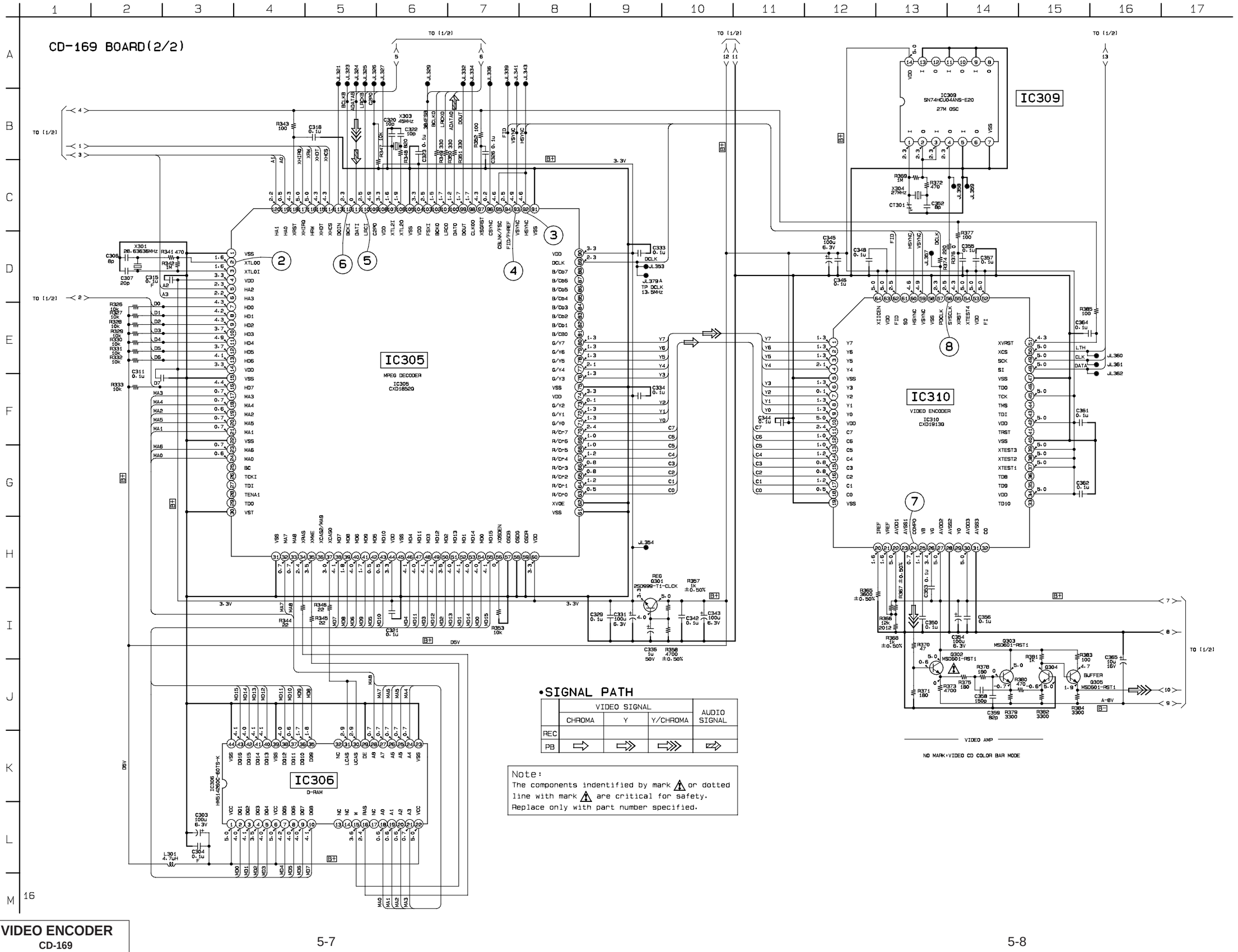
CD-169 (VIDEO-CD MECHA CONTROL) SCHEMATIC DIAGRAM (1/2) • See page 5-9 for printed wiring board. • See page 5-63 for waveforms.

— Ref. No. CD-169 Board; 3,000 Series —



CD-169 (VIDEO ENCODER) SCHEMATIC DIAGRAM (2/2) • See page 5-63 for waveforms.

— Ref. No. CD-169 Board; 3,000 Series —



•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB	⇨	⇨	⇨	⇨

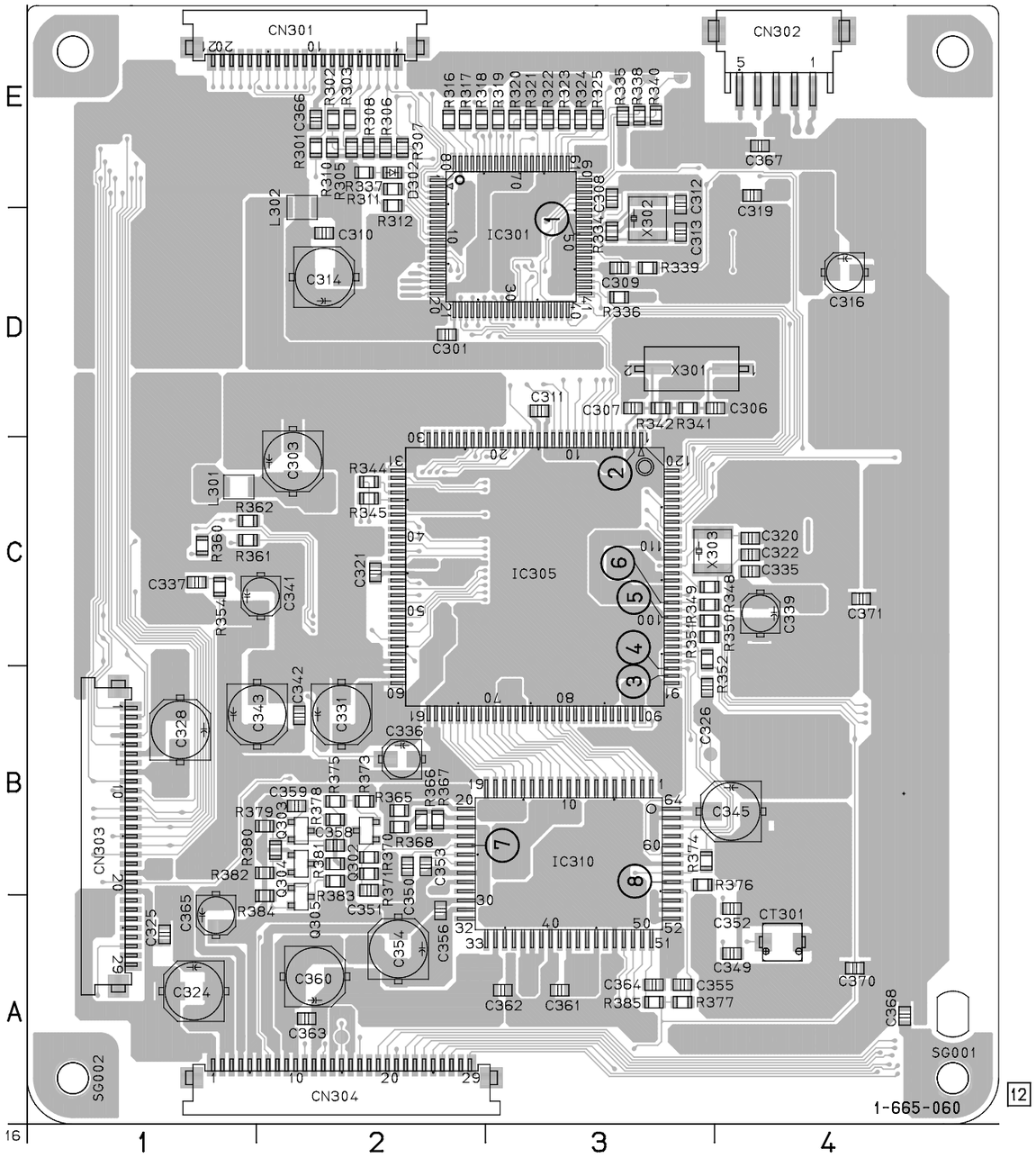
Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

CD-169 (VIDEO-CD MECHA CONTROL, MPEG) PRINTED WIRING BOARD

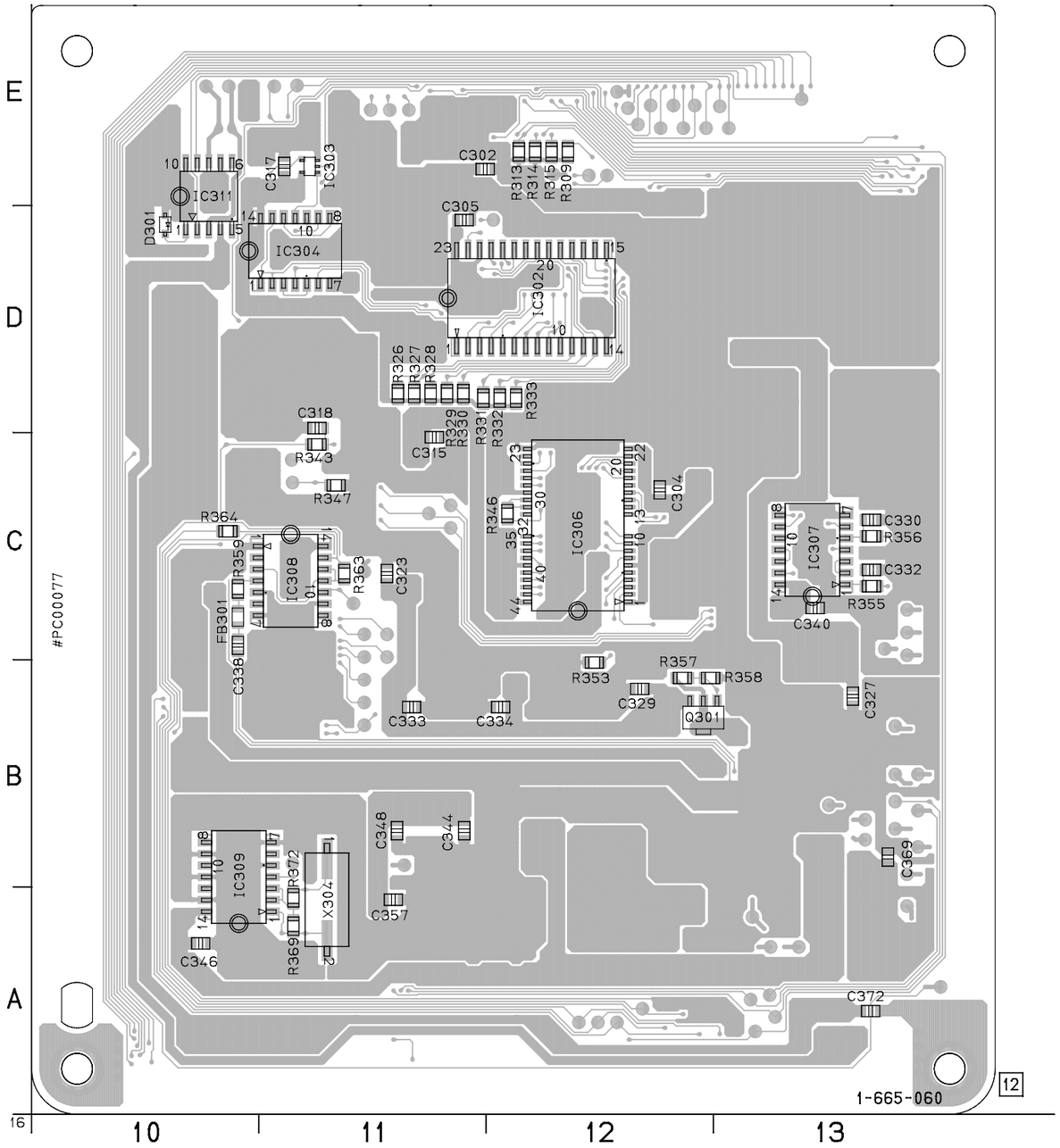
— Ref. No. CD-169 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

CD-169 BOARD (SIDE A)



CD-169 BOARD (SIDE B)



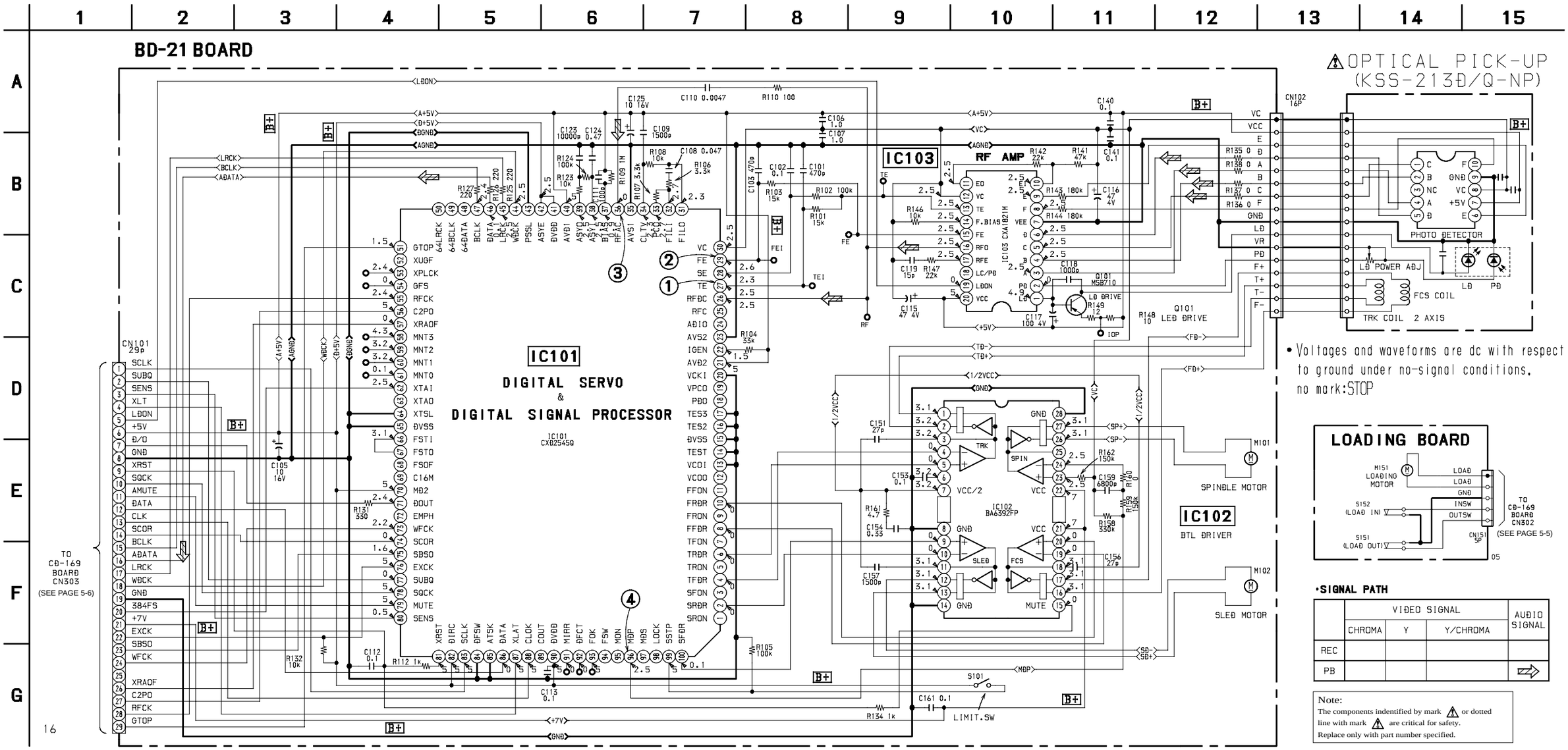
CD-169 BOARD

CN301	E-2	IC306	C-12
CN302	E-4	IC307	C-13
CN303	B-1	IC308	C-11
CN304	A-2	IC309	B-10
		IC310	B-3
D301	D-10	IC311	E-10
D302	E-2		
		Q301	B-12
IC301	D-3	Q302	B-2
IC302	D-12	Q303	B-2
IC303	E-11	Q304	B-2
IC304	D-11	Q305	A-2
IC305	C-3		

BD-21 (RF AMP) , LOADING (LOADING MOTOR) SCHEMATIC DIAGRAM

• See page 5-63 for waveforms.

— Ref. No. BD-21, LOADING Board; 3,000 Series —



•SIGNAL PATH

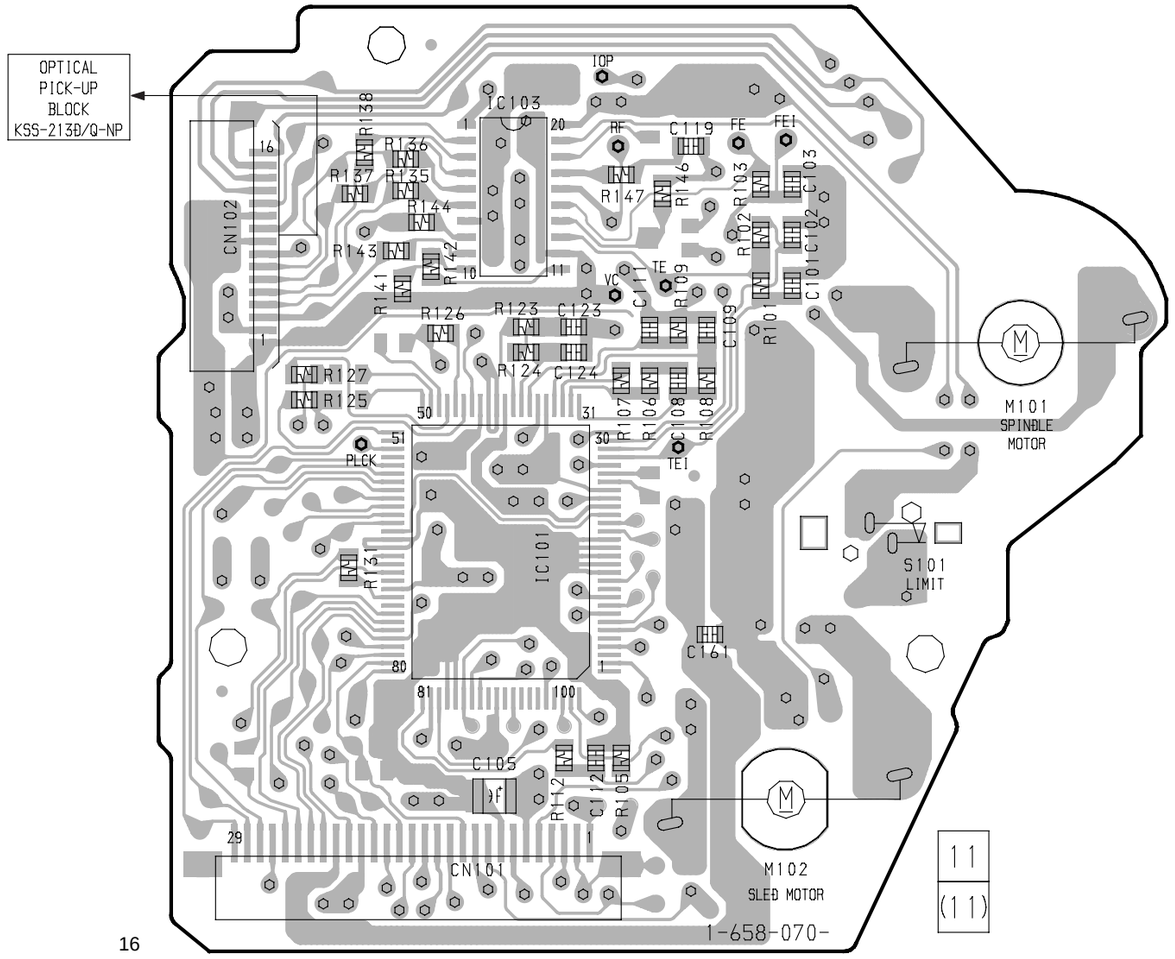
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				⇨

Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

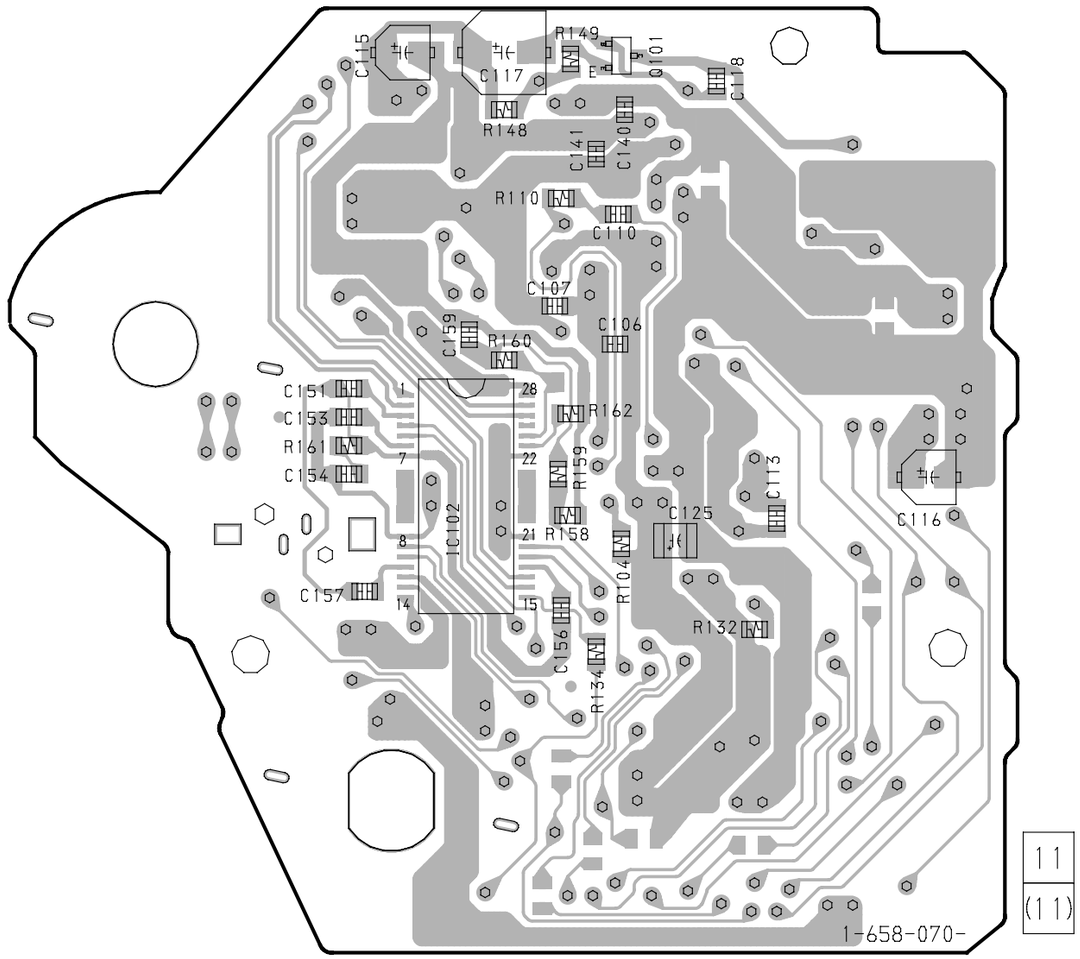
BD-21 (RF AMP) , LOADING (LOADING MOTOR) PRINTED WIRING BOARDS

— Ref. No. BD-21, LOADING Board; 3,000 Series —

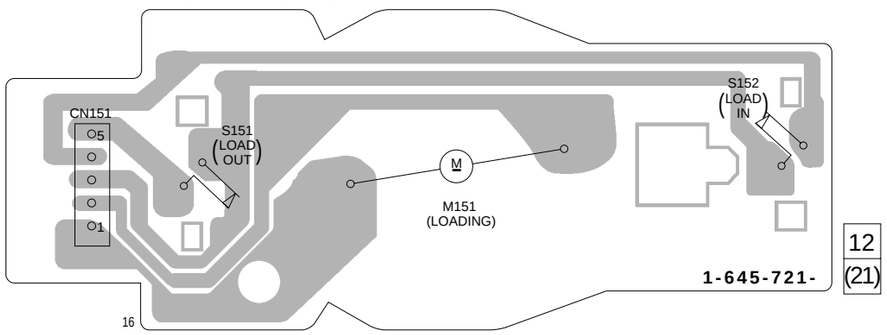
BD-21 BOARD (SIDE A)



BD-21 BOARD (SIDE B)



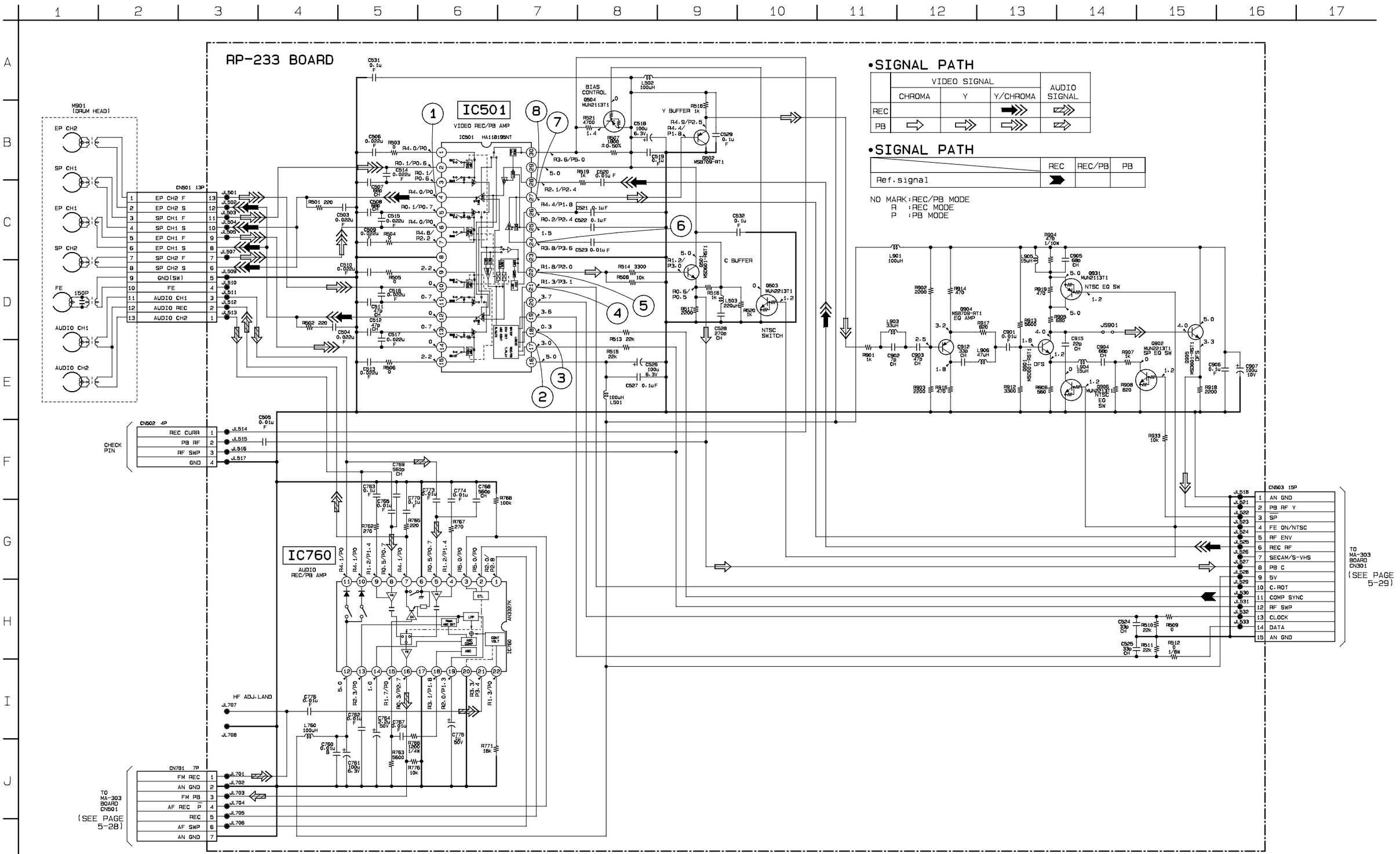
LOADING BOARD



RP-233 (HEAD AMP) SCHEMATIC DIAGRAM

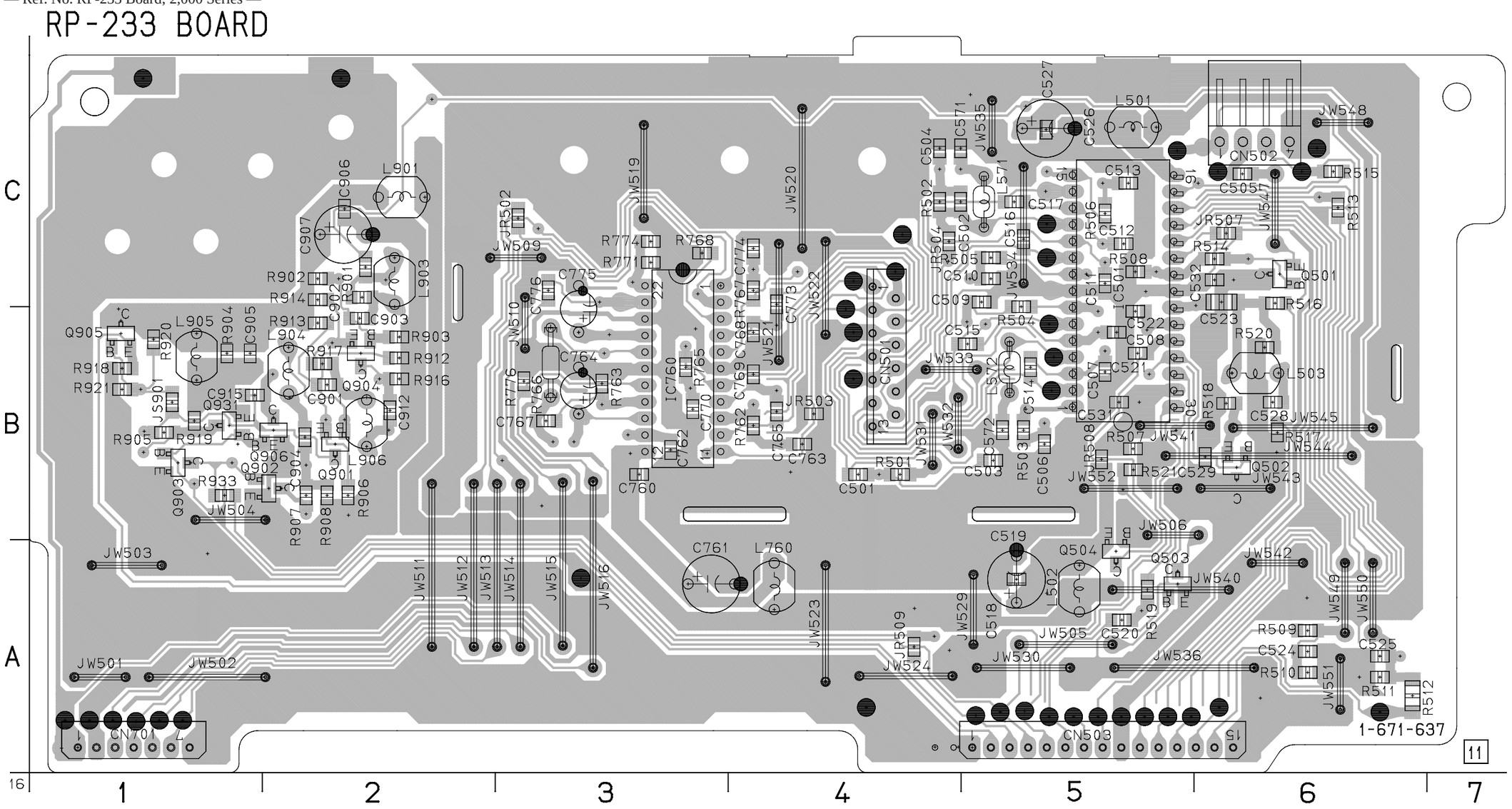
• See page 5-63 for waveforms.

— Ref. No. RP-233 Board; 2,000 Series —



RP-233 (HEAD AMP) PRINTED WIRING BOARD
— Ref. No. RP-233 Board; 2,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.



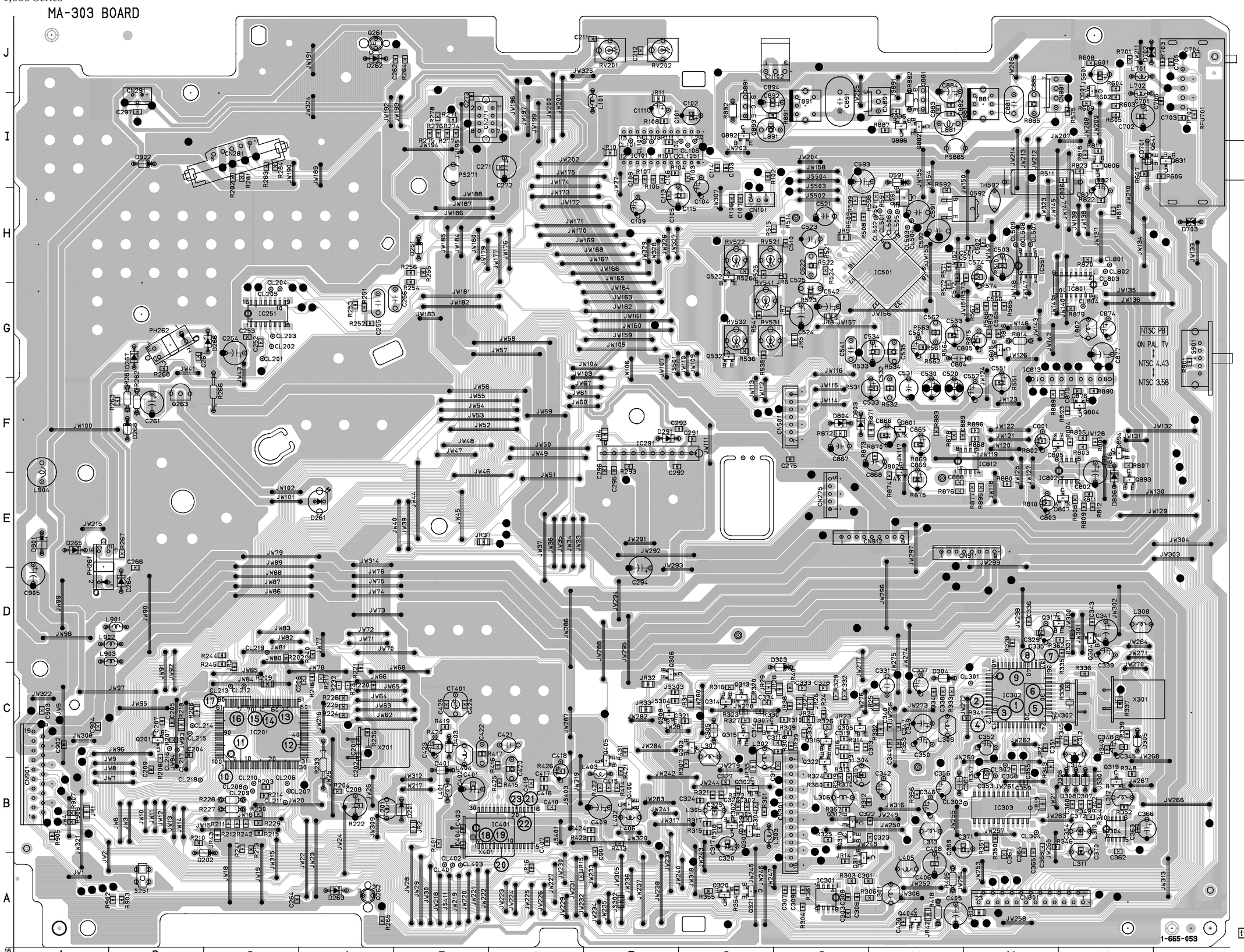
RP-233 BOARD

CN501	B-4
CN502	C-6
CN503	A-5
CN701	A-1
IC501	C-5
IC760	B-3
Q501	C-6
Q502	B-6
Q901	B-2
Q902	B-2
Q904	B-2
Q905	B-1
Q906	B-2
Q931	B-1

MA-303 (VIDEO/AUDIO PROCESS, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARD

— Ref. No. MA-303 Board; 1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.



MA-303 BOARD

CN101	H-8	IC401	B-6
CN102	J-8	IC501	H-10
CN271	I-5	IC551	H-11
CN275	E-9	IC801	H-12
CN281	I-3	IC802	F-12
CN291	J-2	IC812	F-11
CN301	B-9	IC813	G-11
CN501	F-9		
CN801	A-10	Q201	C-2
CN881	J-11	Q261	J-4
CN891	J-9	Q262	A-4
CN901	B-1	Q301	B-8
CN911	E-11	Q302	C-8
CN912	E-9	Q303	C-8
		Q304	D-12
D201	B-5	Q306	D-7
D202	A-3	Q307	C-8
D251	H-4	Q308	C-7
D261	E-4	Q309	B-8
D265	E-1	Q310	B-9
D267	G-2	Q311	A-9
D268	D-2	Q312	B-9
D291	F-7	Q313	C-8
D304	D-10	Q314	C-8
D305	C-12	Q315	C-8
D306	B-12	Q316	C-9
D307	B-12	Q317	D-11
D308	B-12	Q319	C-12
D401	B-5	Q320	A-8
D403	C-5	Q321	A-8
D591	I-10	Q322	C-9
D701	I-12	Q404	A-10
D801	F-10	Q405	C-7
D802	F-10	Q522	H-8
D803	F-9	Q532	G-8
D804	F-9	Q591	I-10
D805	F-11	Q592	I-11
D806	E-12	Q631	I-13
D807	E-12	Q641	I-12
D901	E-1	Q804	F-12
D902	I-2	Q805	G-11
		Q806	I-12
IC101	I-7	Q881	J-10
IC201	C-3	Q882	I-10
IC251	G-3	Q886	I-10
IC291	F-7	Q891	J-8
IC301	A-9	Q892	I-8
IC302	C-11	Q893	F-12
IC303	B-11	Q894	F-12
IC304	B-12		

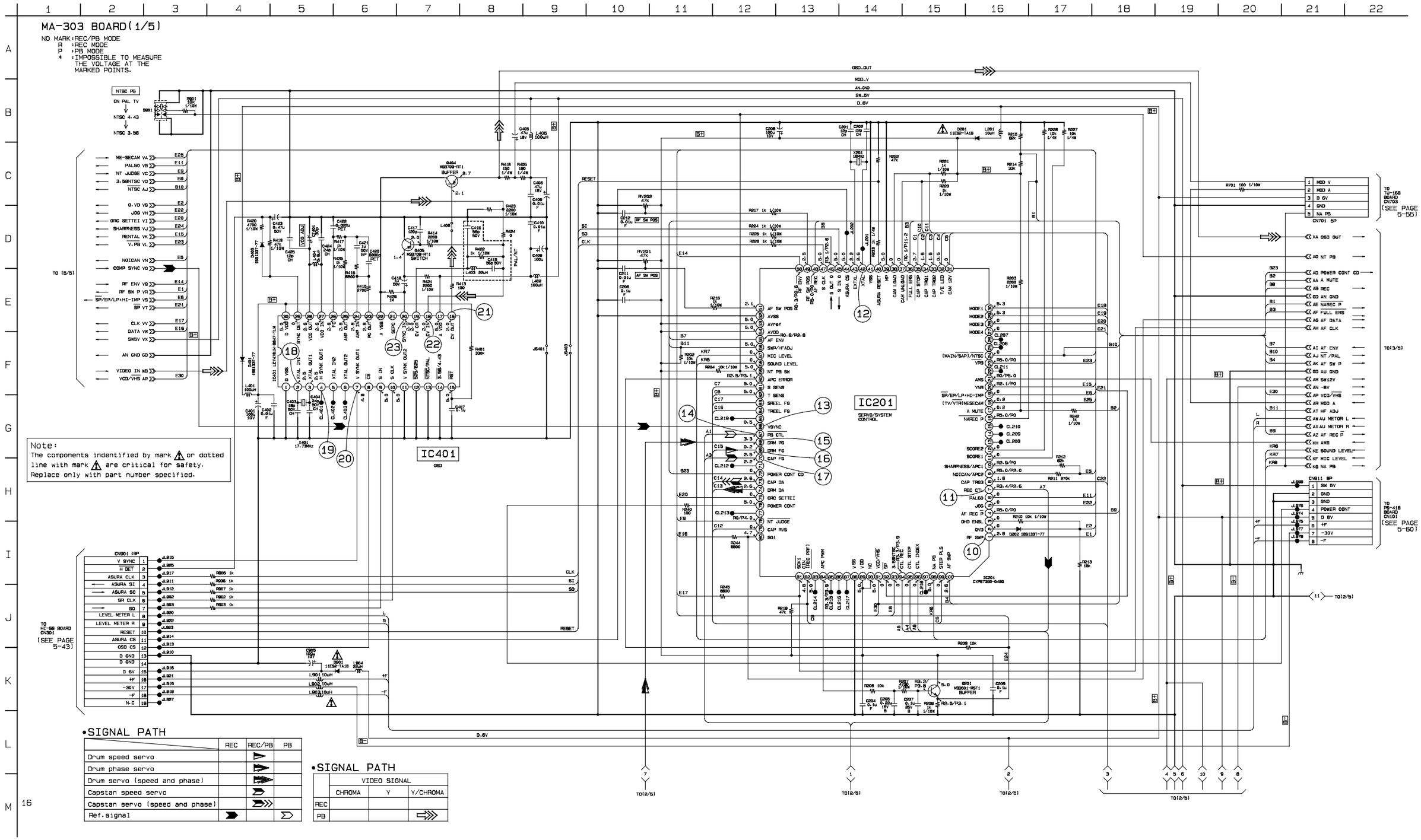
VIDEO/AUDIO PROCESS, SERVO/SYSTEM CONTROL

MA-303

MA-303 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM (1/5)

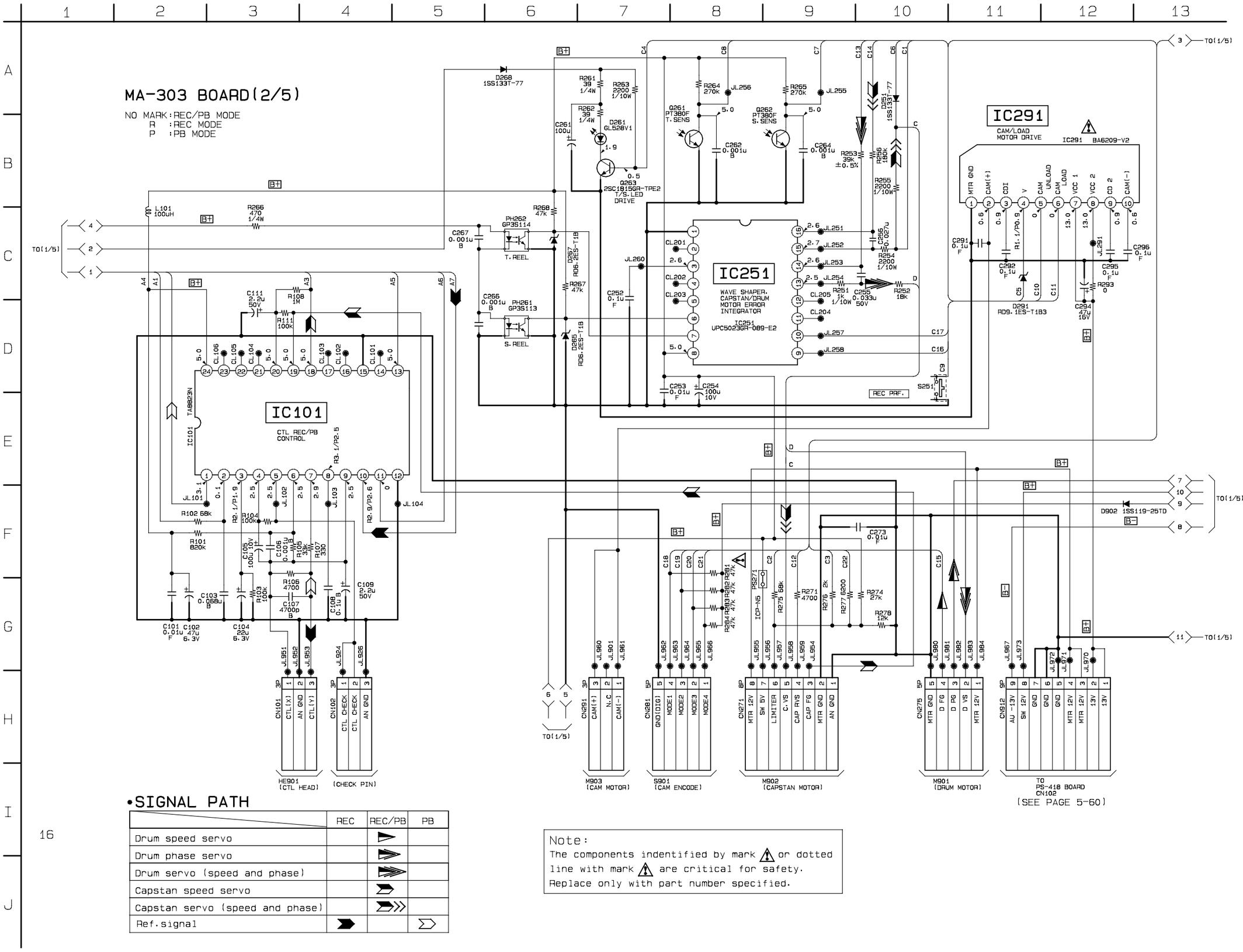
• See page 5-64 for waveforms.

— Ref. No. MA-303 Board; 1,000 Series —



MA-303 (CTL, REC/PB CONTROL) SCHEMATIC DIAGRAM (2/5) • See page 5-19 for printed wiring board.

— Ref. No. MA-303 Board; 1,000 Series —



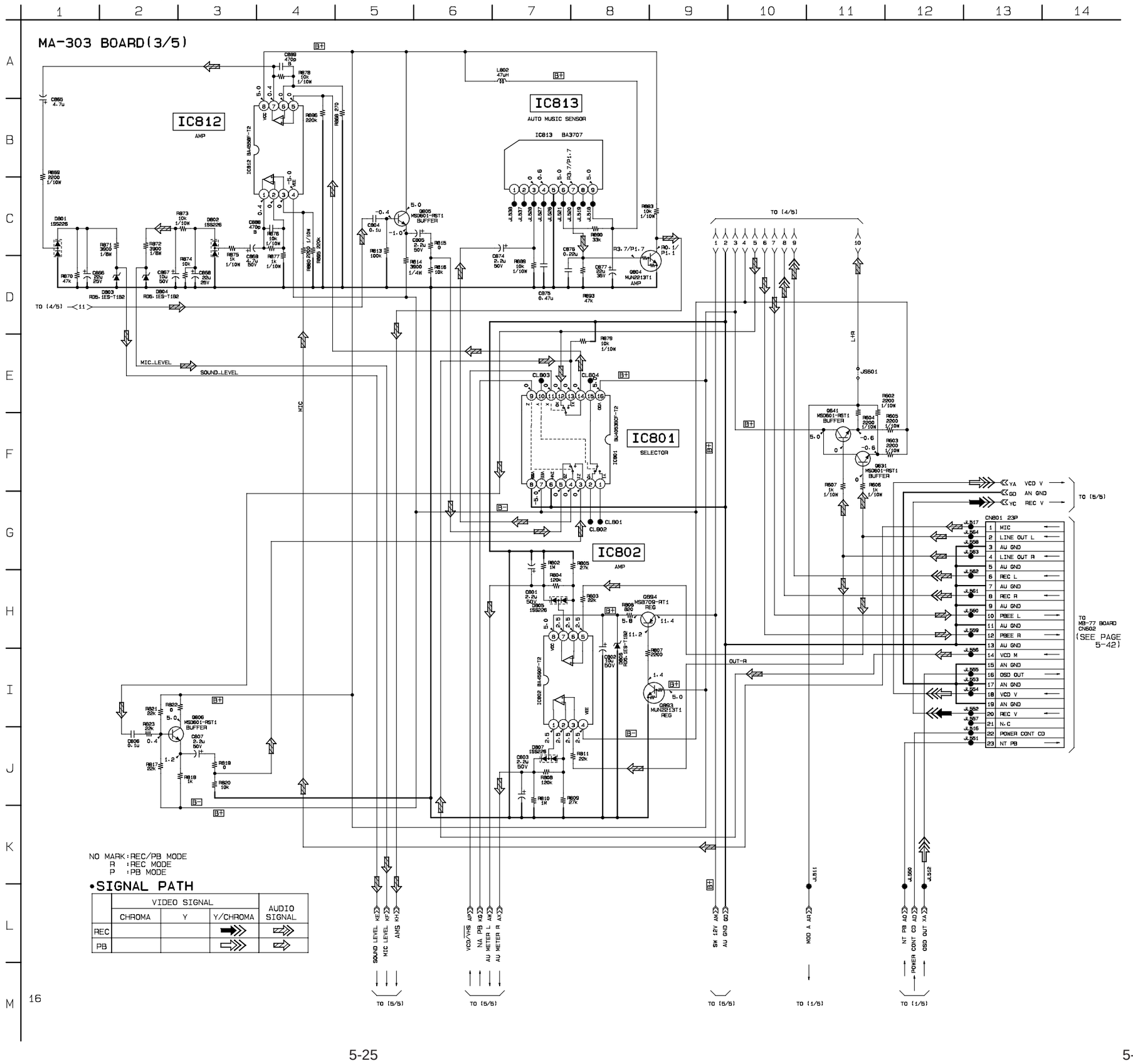
•SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶	
Drum servo (speed and phase)		▶	
Capstan speed servo		▶	
Capstan servo (speed and phase)		▶	
Ref.signal	▶		▷

Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-303 (SELECTOR) SCHEMATIC DIAGRAM (3/5) • See page 5-19 for printed wiring board.

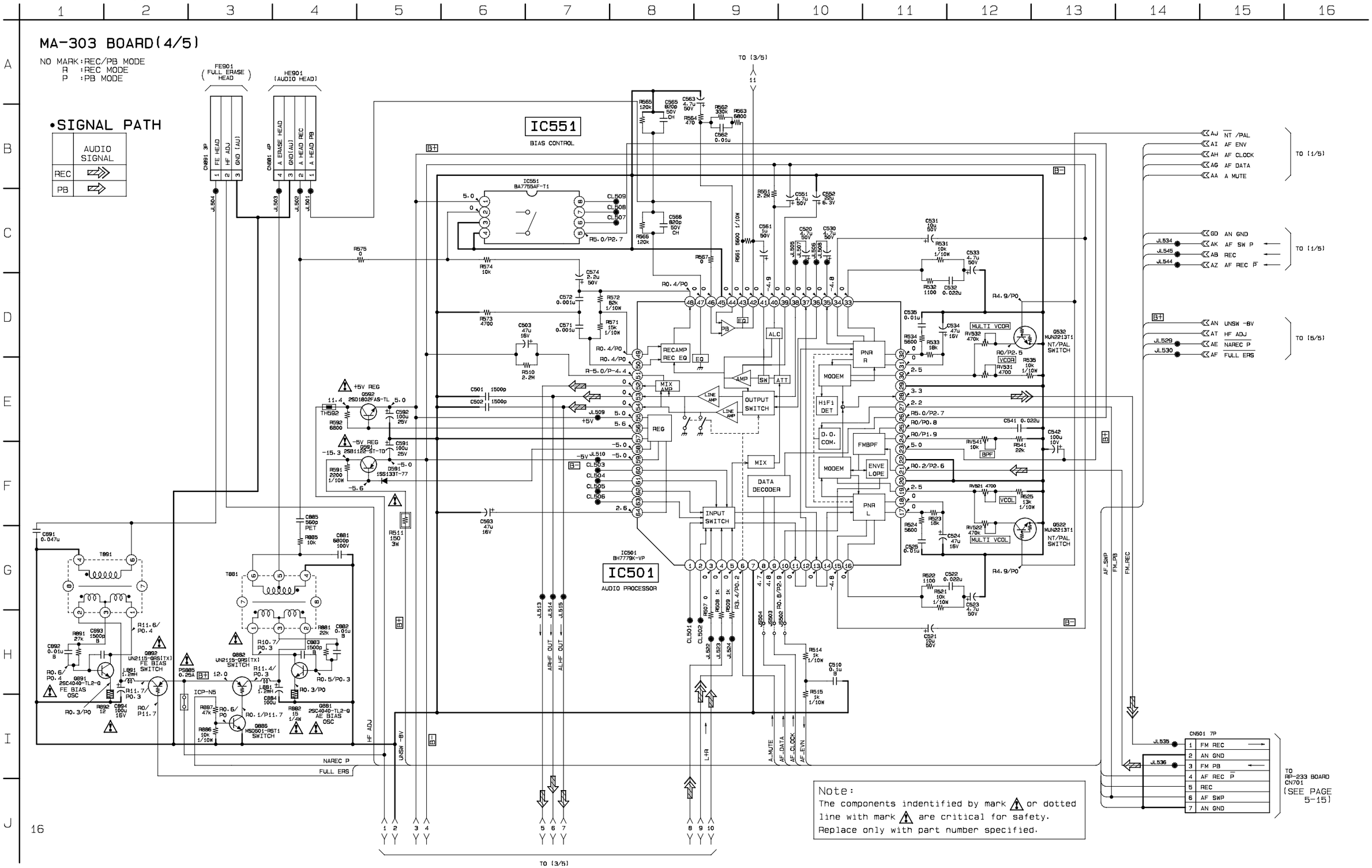
— Ref. No. MA-303 Board; 1,000 Series —



MA-303 (AUDIO PROCESSOR) SCHEMATIC DIAGRAM (4/5)

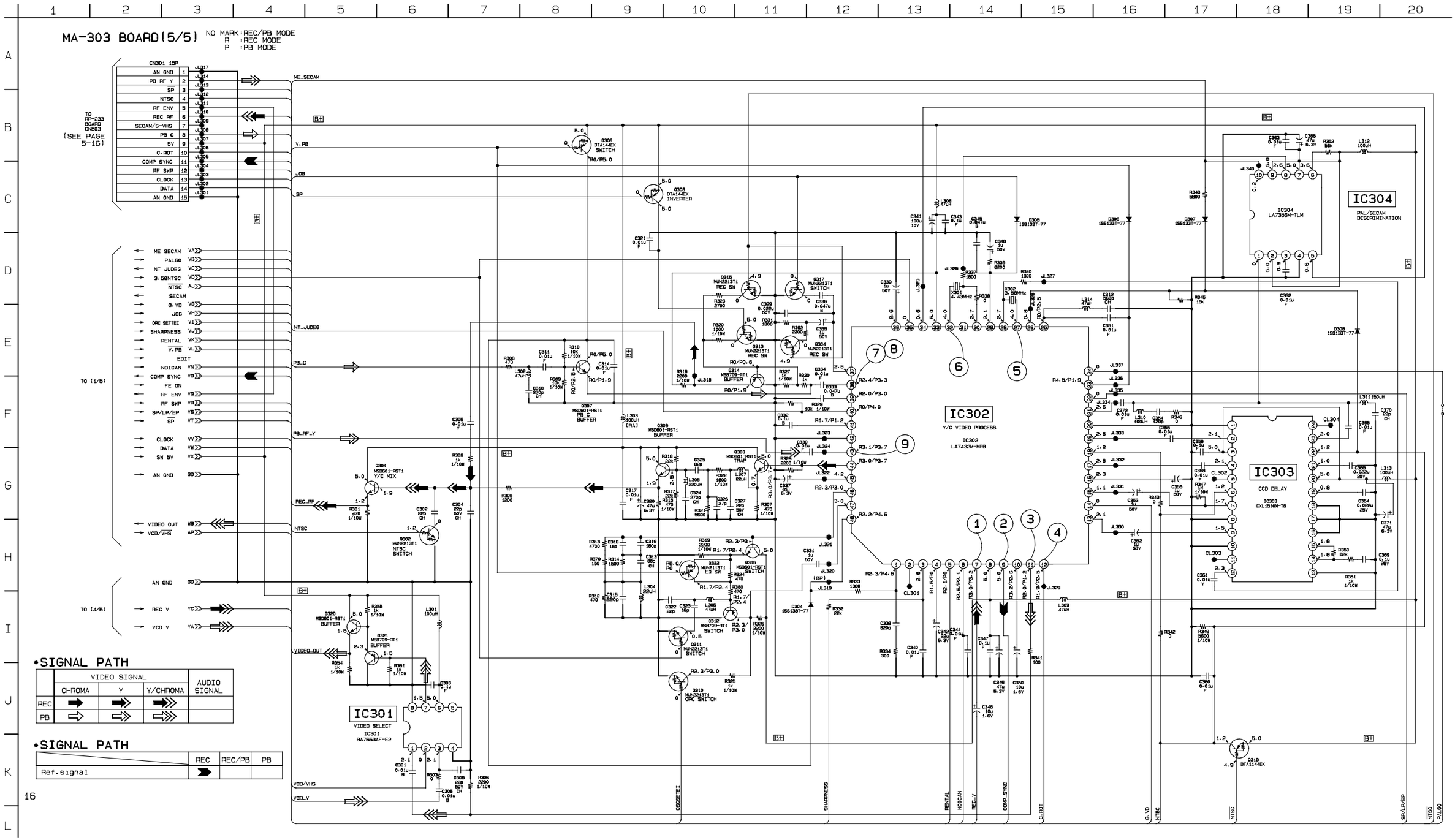
— Ref. No. MA-303 Board; 1,000 Series —

• See page 5-19 for printed wiring board.



MA-303 (Y/C VIDEO PROCESS) SCHEMATIC DIAGRAM (5/5) • See page 5-19 for printed wiring board. • See page 5-64 for waveforms.

— Ref. No. MA-303 Board; 1,000 Series —



MB-77 (KARAOKE DSP, AUDIO I/O) PRINTED WIRING BOARD (SIDE A)

— Ref. No. MB-77 Board; 5,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

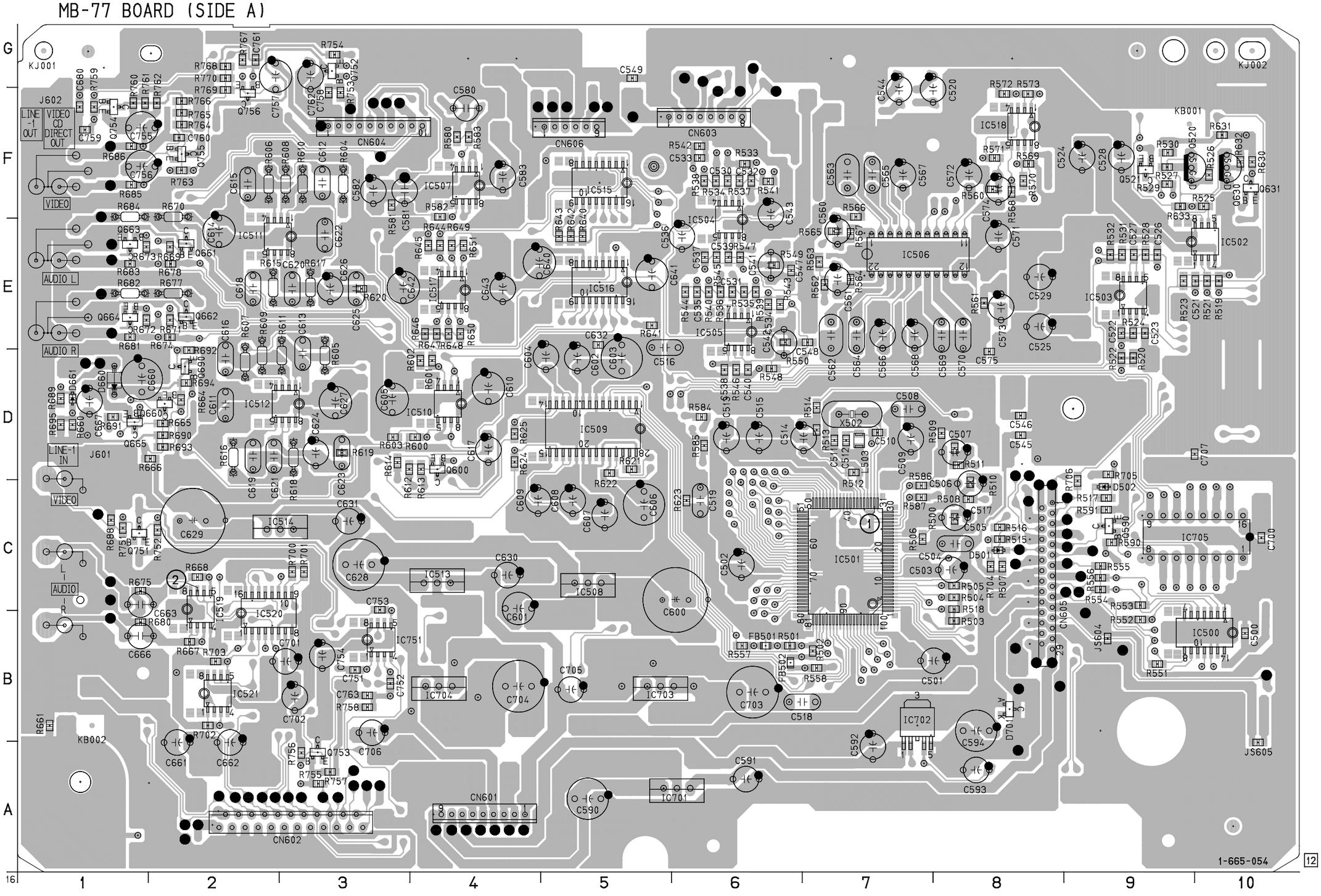
MB-77 BOARD (SIDE A)

CN601 A-4
CN602 A-3
CN603 F-6
CN604 F-3
CN605 C-9

D501 C-8
D502 C-9
D660 D-1
D661 D-1
D701 B-8

IC500 C-10
IC501 C-7
IC502 F-10
IC503 E-9
IC504 F-6
IC505 E-6
IC506 E-7
IC507 F-4
IC508 C-5
IC509 D-5
IC510 D-4
IC511 E-2
IC512 D-2
IC513 C-4
IC514 C-3
IC515 F-5
IC516 E-5
IC517 E-4
IC518 F-8
IC519 B-2
IC520 B-2
IC521 B-2
IC701 A-5
IC702 B-7
IC703 B-5
IC704 B-4
IC705 C-10
IC751 B-4

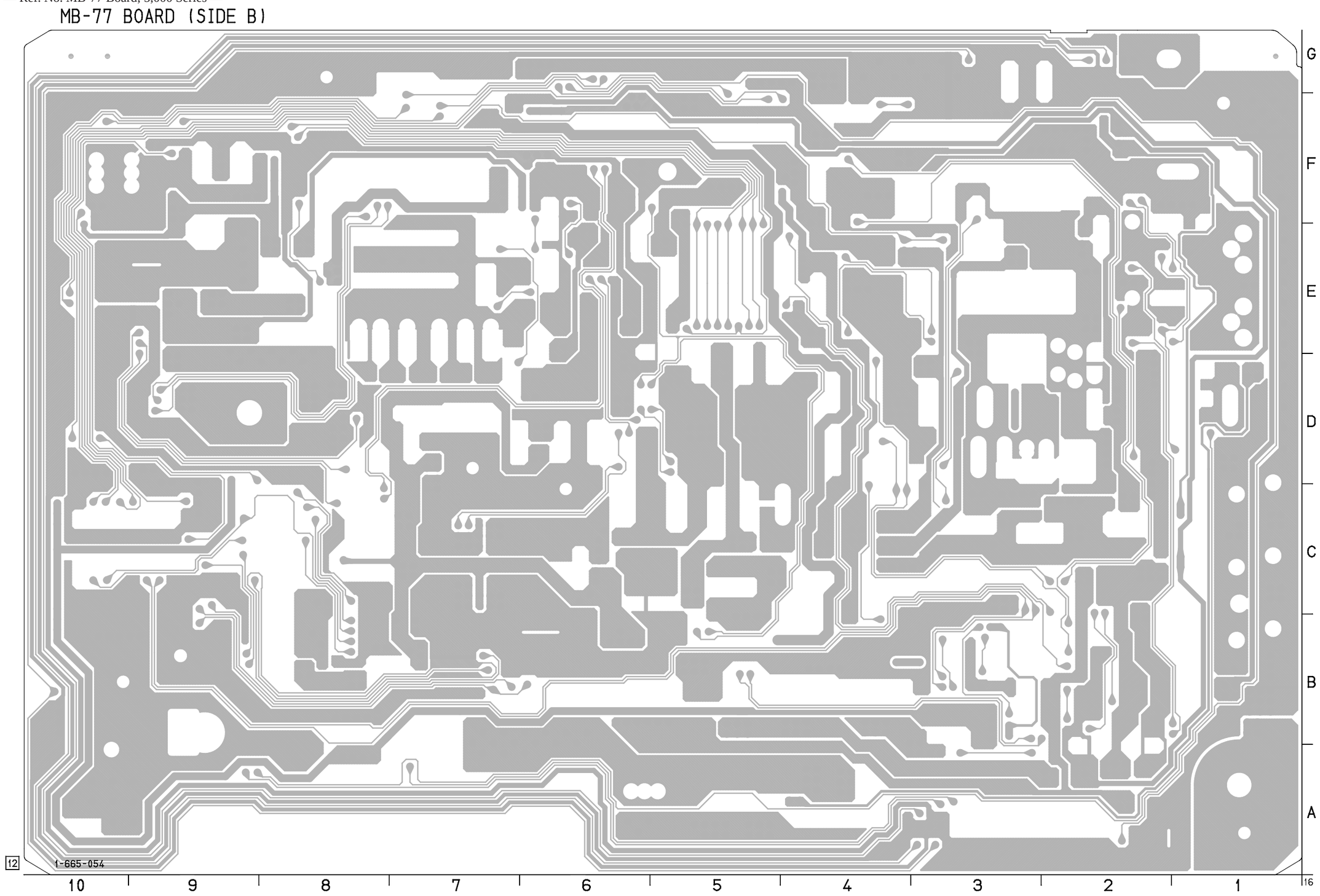
Q520 F-10
Q521 F-9
Q590 C-9
Q600 D-4
Q630 F-10
Q631 F-10
Q660 D-2
Q661 E-2
Q662 E-2
Q663 E-1
Q664 E-1
Q665 D-1
Q690 D-2
Q751 C-1
Q752 G-3
Q753 A-3
Q754 F-1
Q755 F-2
Q756 F-2



MB-77 (KARAOKE DSP, AUDIO I/O) PRINTED WIRING BOARD (SIDE B)

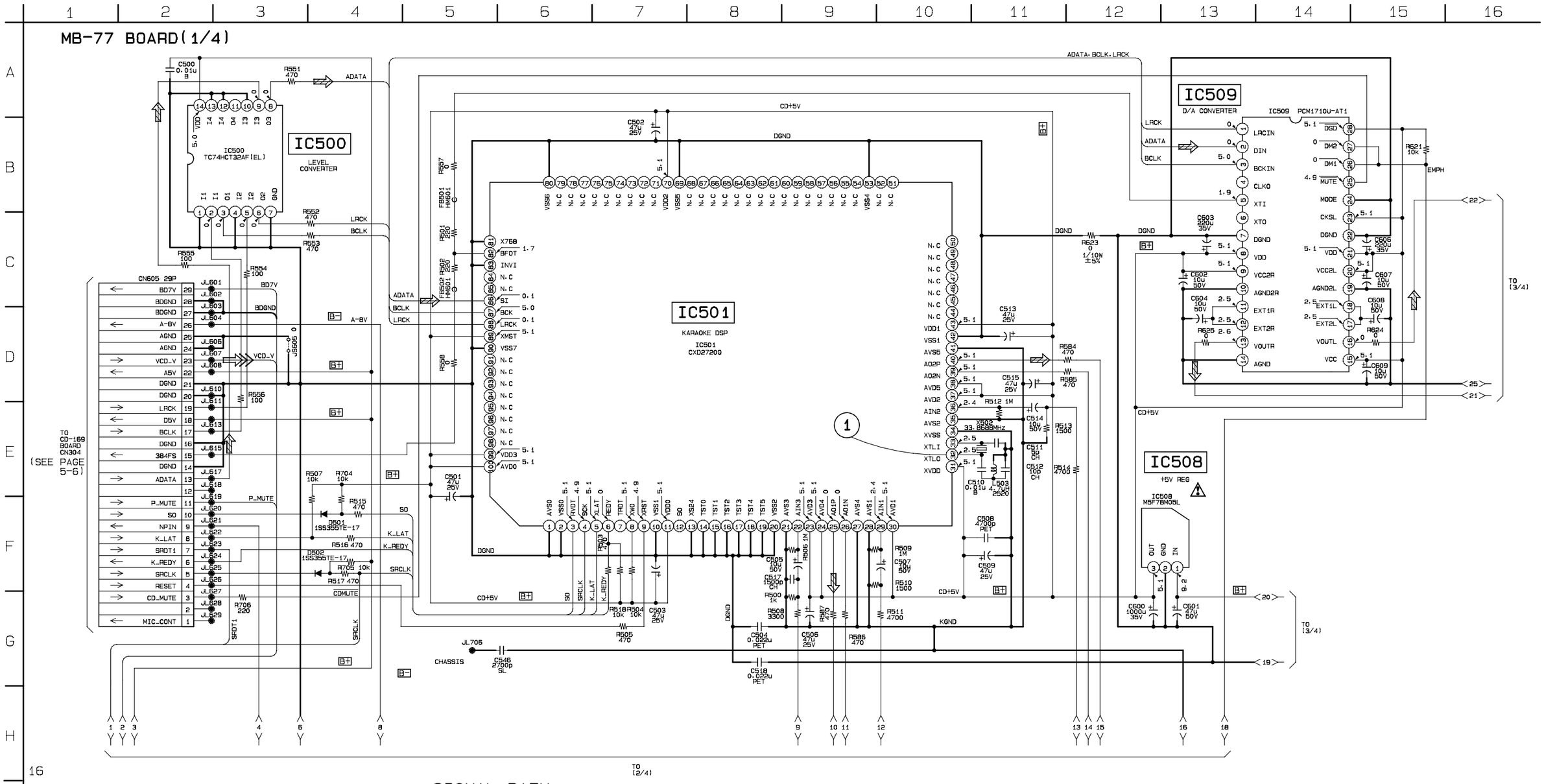
— Ref. No. MB-77 Board; 5,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.



MB-77 (KARAOKE DSP) SCHEMATIC DIAGRAM (1/4) • See page 5-31 for printed wiring board. • See page 5-63 for waveform.

— Ref. No. MB-77 Board; 5,000 Series —



Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

MB-77 (AUDIO IN/OUT) SCHEMATIC DIAGRAM (2/4) • See page 5-31 for printed wiring board.

— Ref. No. MB-77 Board; 5,000 Series —

MB-77 BOARD(2/4)

Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

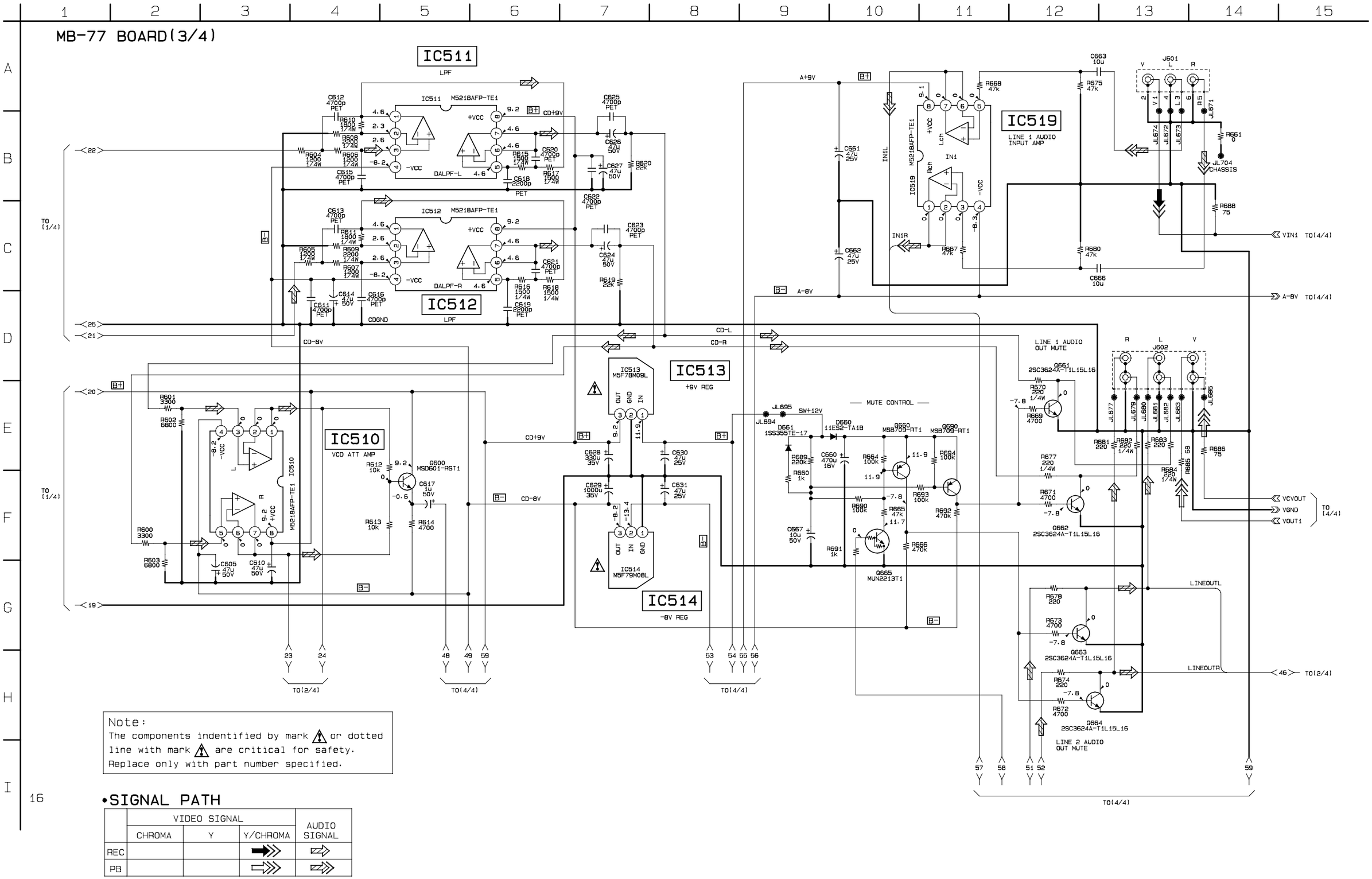
IC503 LINE AD LPF
IC504 LPF
IC505 LPF
IC502 MIC AD LPF MICDRY SW
IC506 SURROUND PROCESSOR
IC507 LINE2 AIDIO INPUT AMP
IC515 AUDIO OUTPUT SELECT L
IC516 AUDIO OUTPUT SELECTOR
IC518 SURROUND AMP
IC705 AV CONTROL S/P CONV.
IC702 +5V REG
IC701 +7V REG

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

MB-77 (SURROUND PROCESSOR) SCHEMATIC DIAGRAM (3/4) • See page 5-31 for printed wiring board.

— Ref. No. MB-77 Board; 5,000 Series —



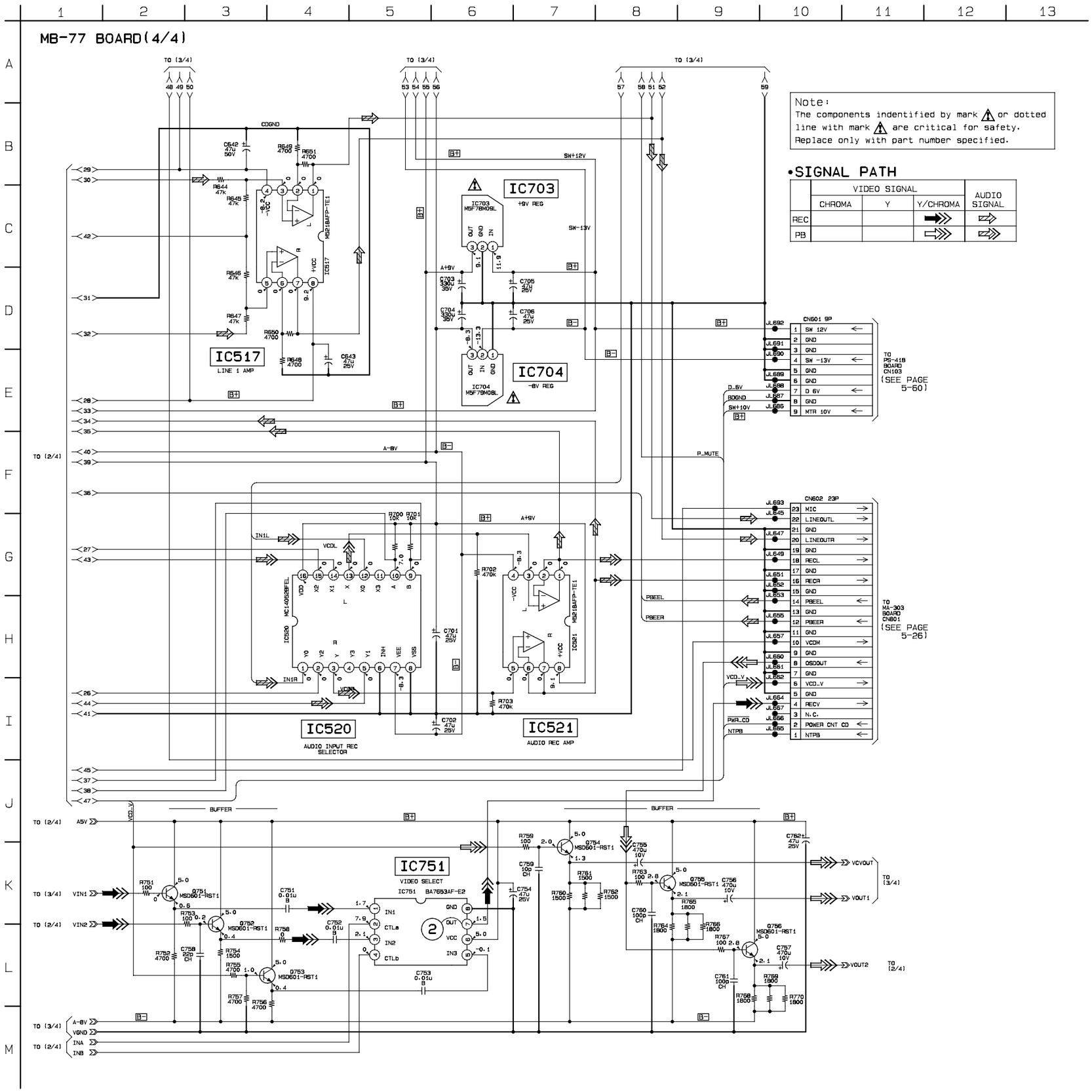
Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

MB-77 (VIDEO SELECT) SCHEMATIC DIAGRAM (4/4) • See page 5-31 for printed wiring board. • See page 5-63 for waveform.

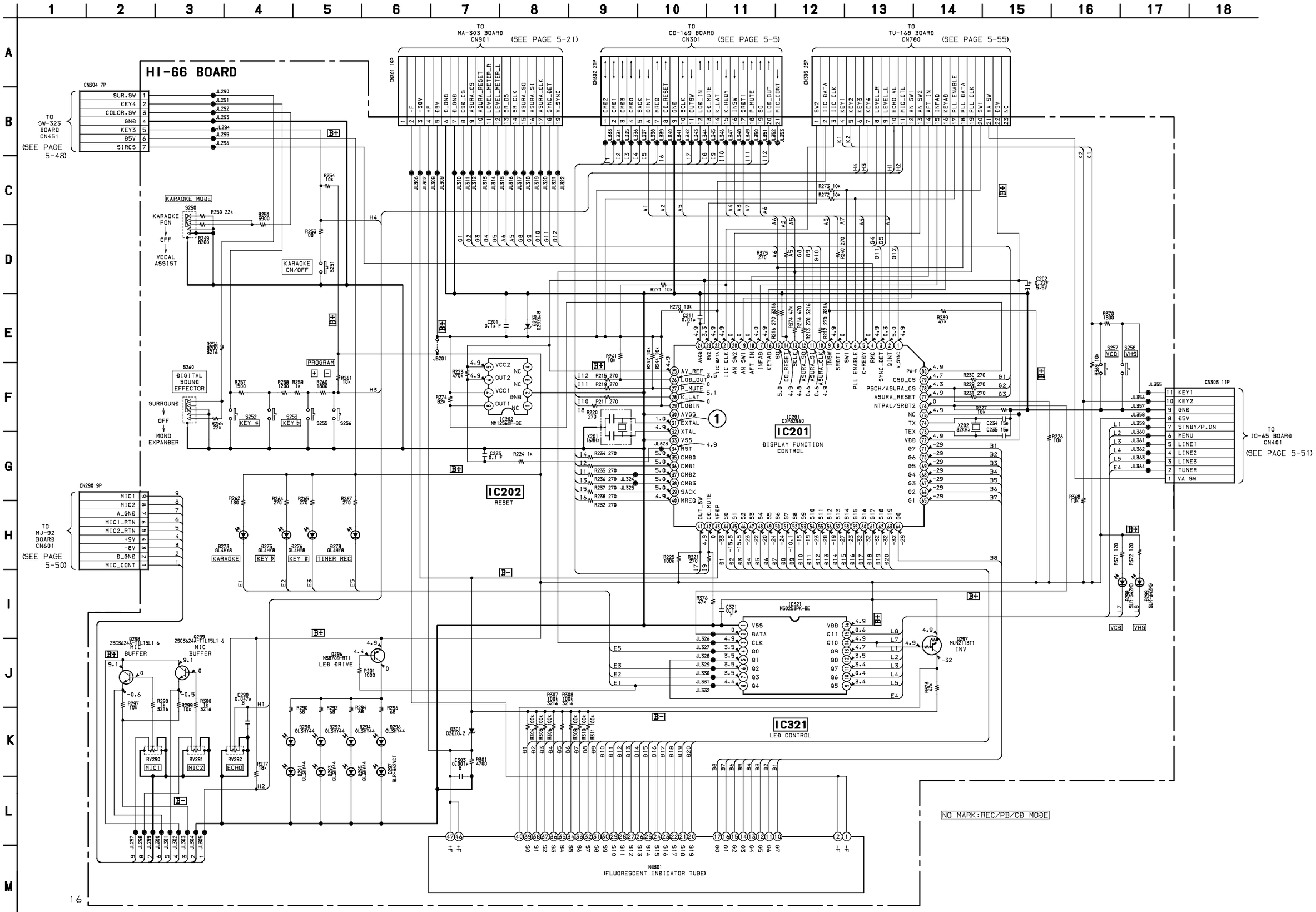
— Ref. No. MB-77 Board; 5,000 Series —



HI-66 (DISPLAY/FUNCTION CONTROL) SCHEMATIC DIAGRAM

• See page 5-63 for waveform.

— Ref. No. HI-66 Board; 4,000 Series —

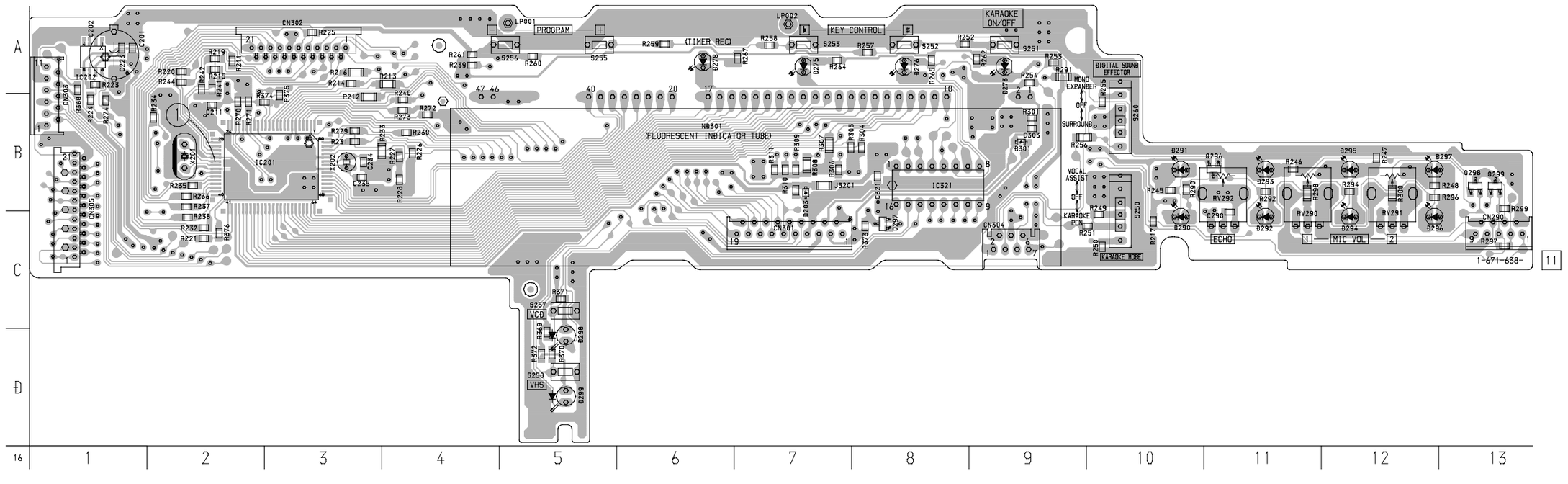


HI-66 (DISPLAY/FUNCTION CONTROL) PRINTED WIRING BOARD

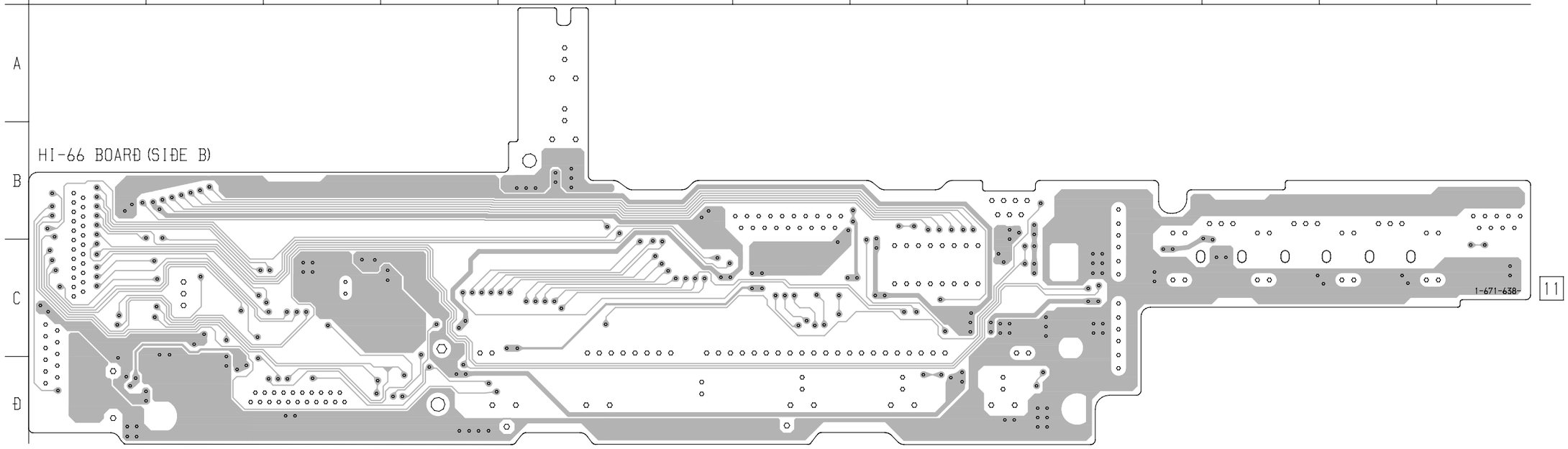
— Ref. No. HI-66 Board; 4,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

HI-66 BOARD (SIDE A)



HI-66 BOARD (SIDE B)



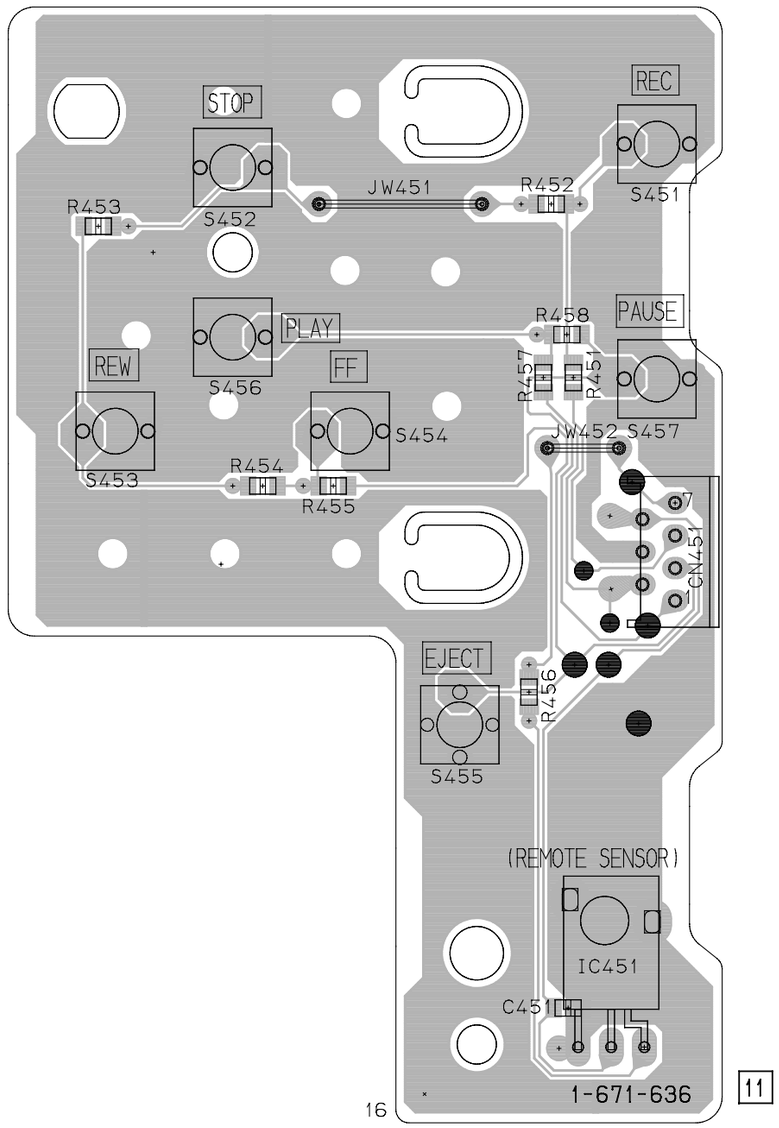
HI-66 BOARD

CN290	B-13
CN301	C-7
CN302	A-3
CN303	A-1
CN304	C-9
CN305	B-1
D273	A-9
D275	A-7
D276	A-8
D278	A-6
D290	B-10
D291	B-10
D292	B-11
D293	B-11
D294	B-12
D295	B-12
D296	B-12
D297	B-12
D298	D-5
D299	D-5
D301	B-9
IC201	B-3
IC202	A-1
IC321	B-8
Q296	B-11
Q297	B-8
Q298	B-13
Q299	B-13

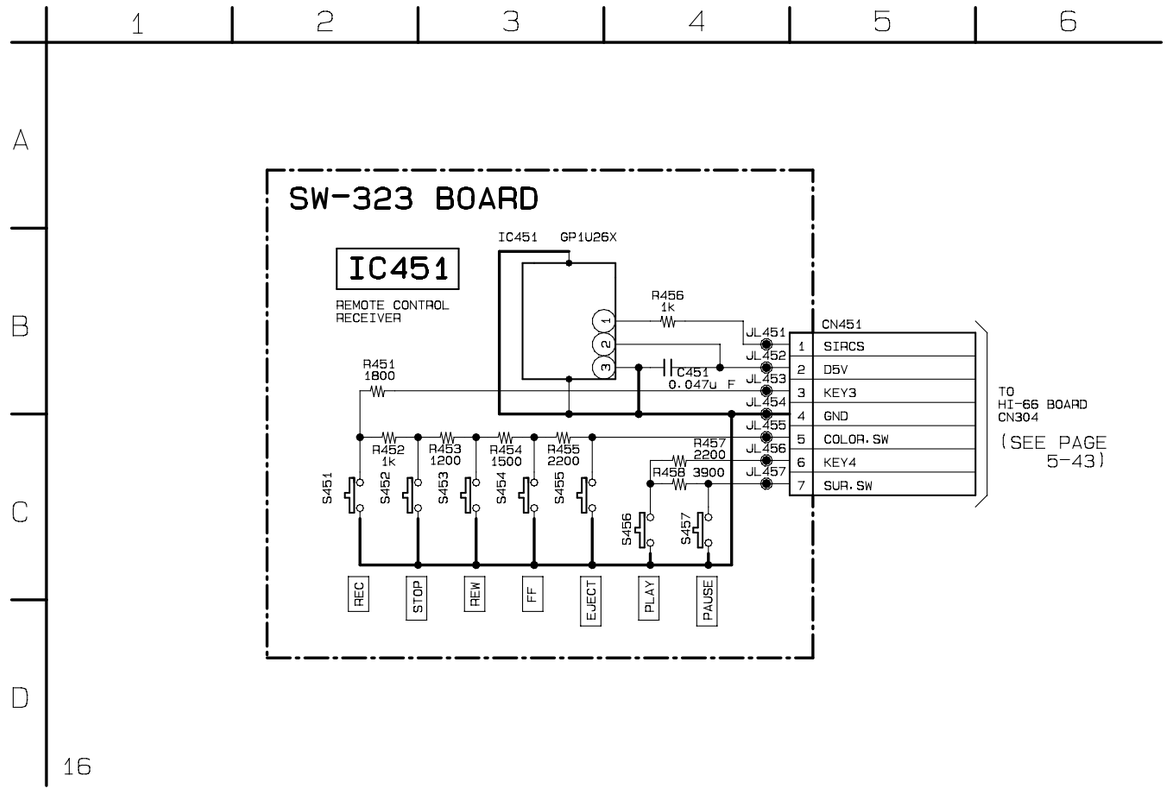
SW-323 (FUNCTION SWITCH) PRINTED WIRING BOARD
— Ref. No. SW-323 Board; 4,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

SW-323 BOARD

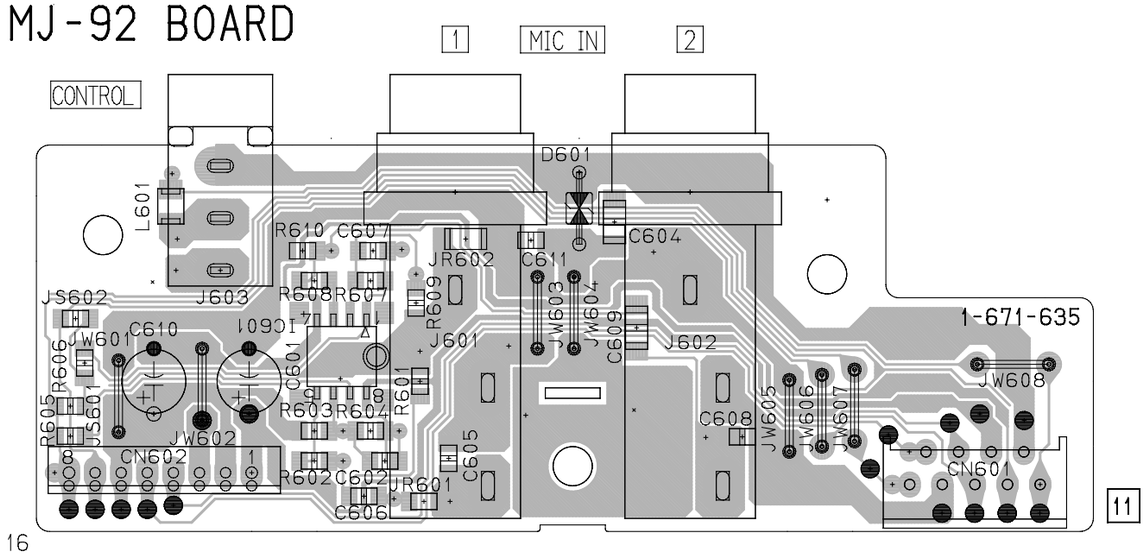


SW-323 (FUNCTION SWITCH) SCHEMATIC DIAGRAM
— Ref. No. SW-323 Board; 4,000 Series —

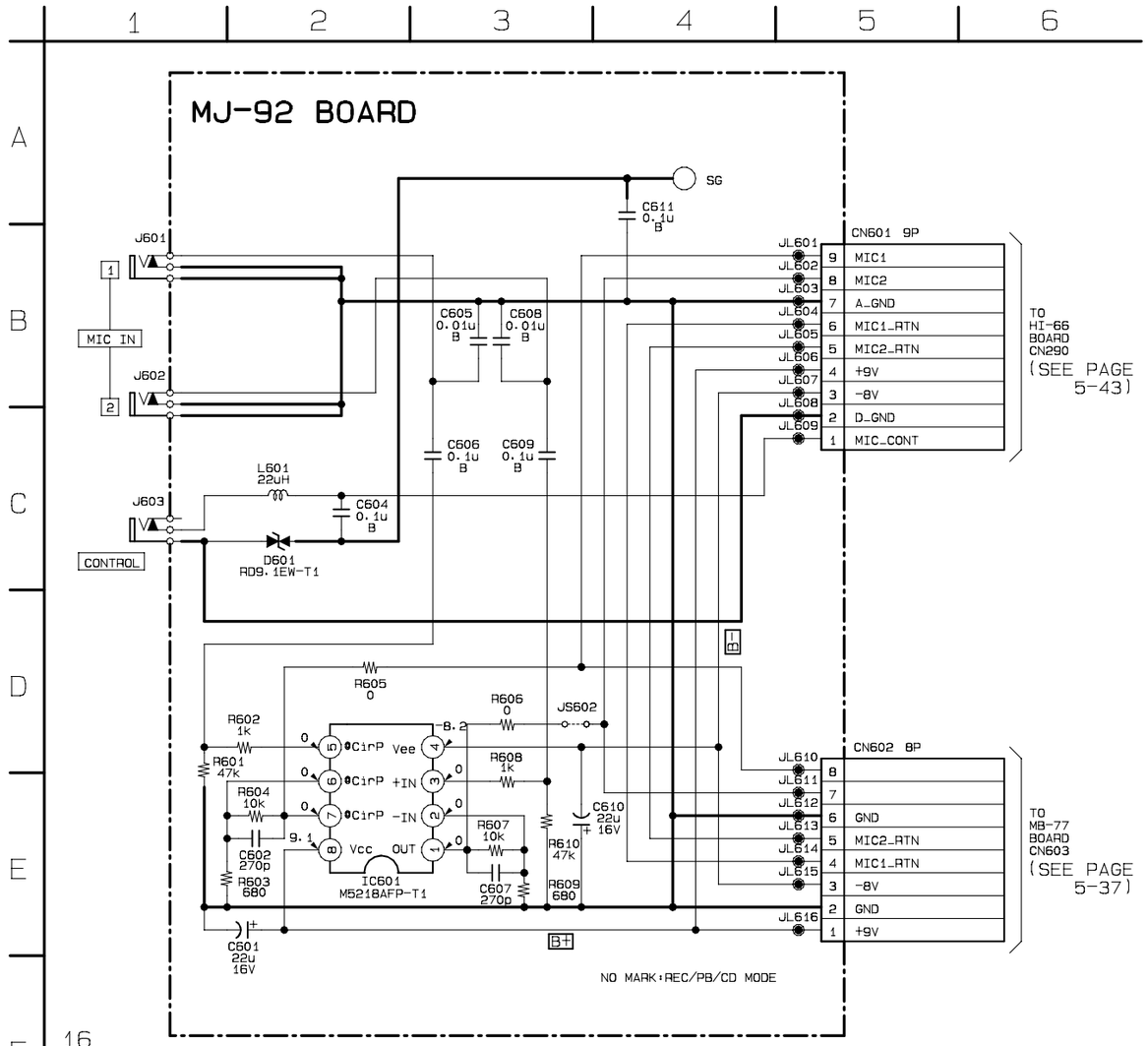


MJ-92 (MIC AMP) PRINTED WIRING BOARD
— Ref. No. MJ-92 Board; 4,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

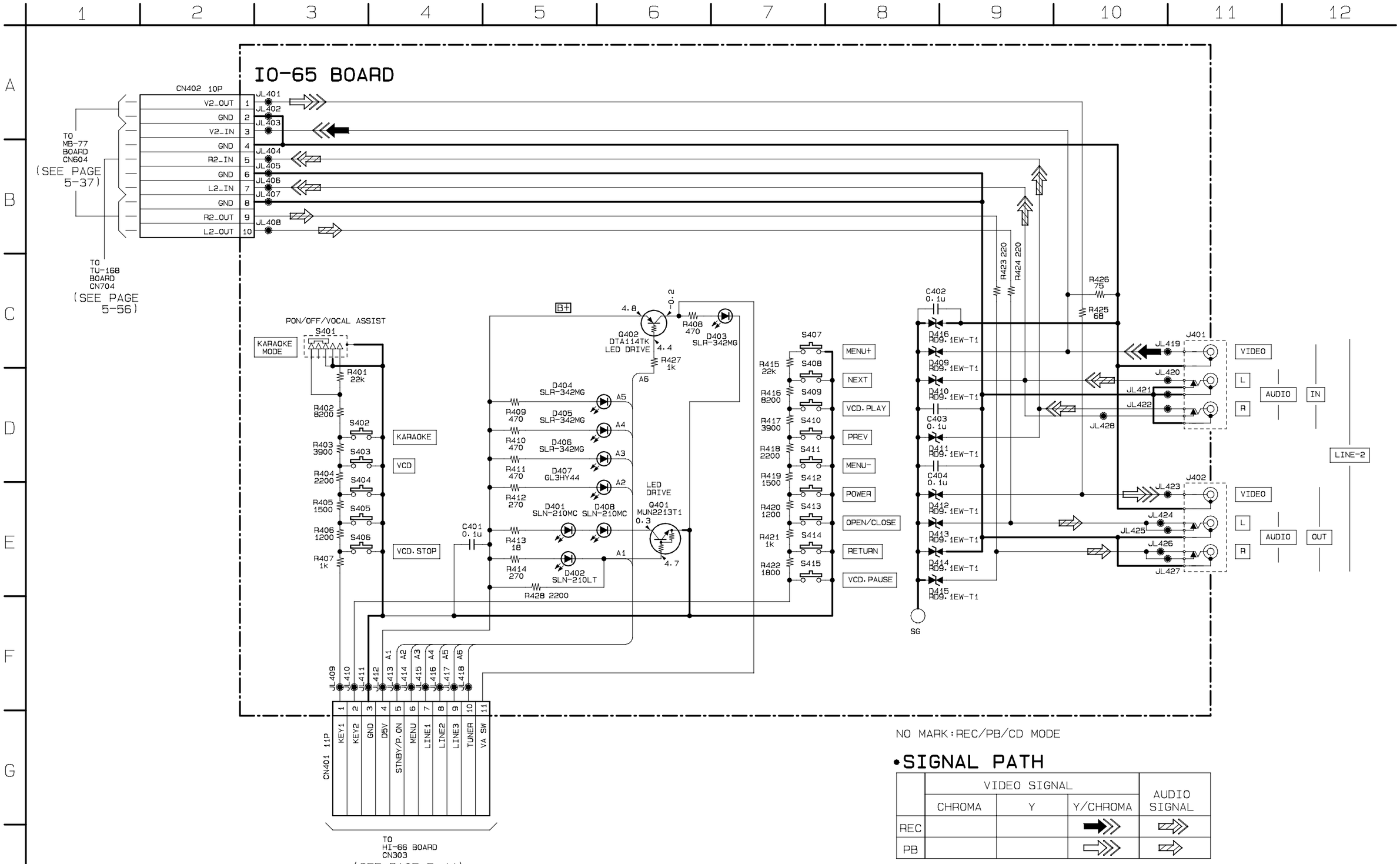


MJ-92 (MIC AMP) SCHEMATIC DIAGRAM
— Ref. No. MJ-92 Board; 4,000 Series —



IO-65 (FRONT JACK) SCHEMATIC DIAGRAM

— Ref. No. IO-65 Board; 4,000 Series —



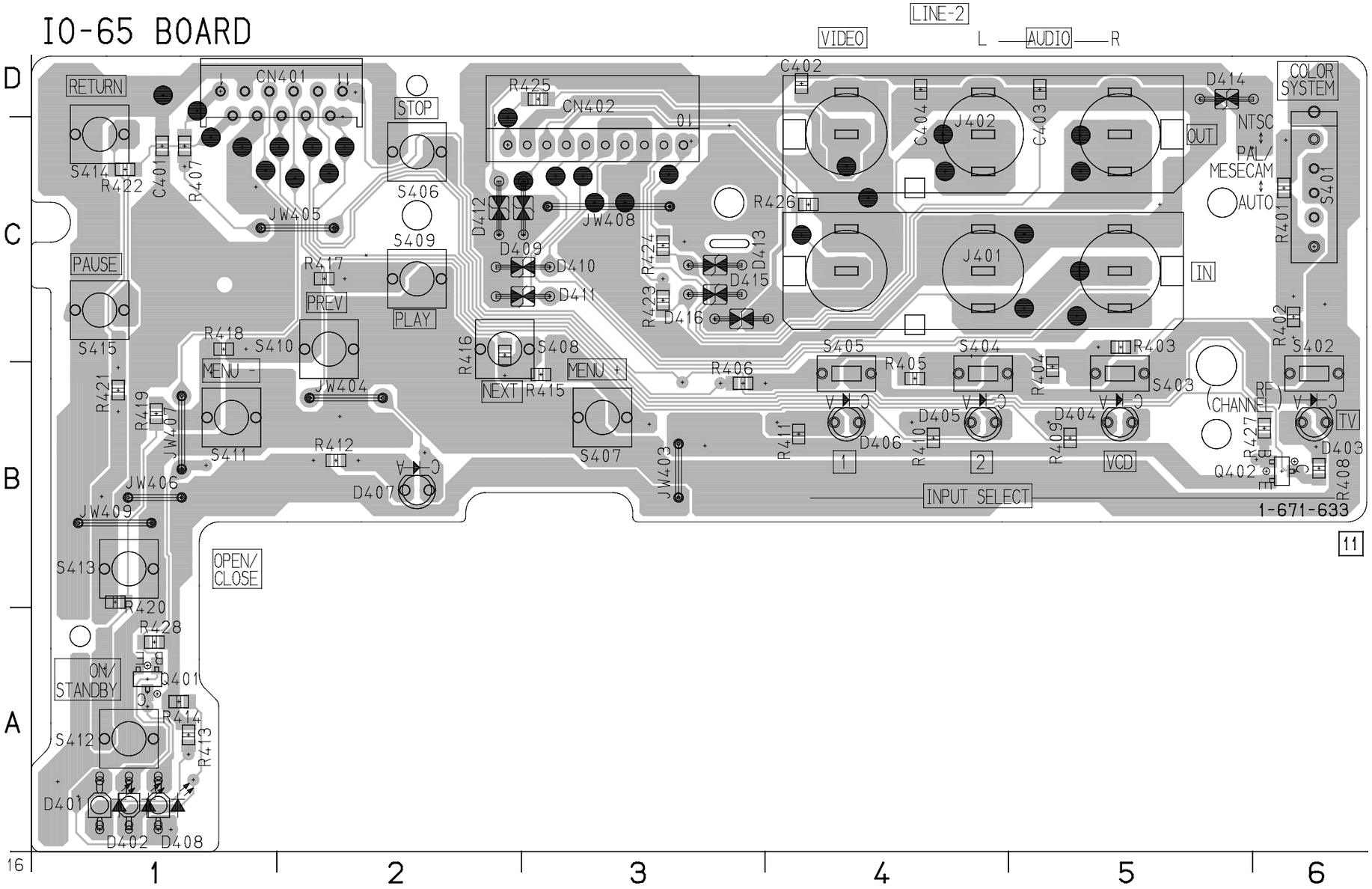
NO MARK:REC/PB/CD MODE

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

IO-65 (FRONT JACK) PRINTED WIRING BOARD
— Ref. No. IO-65 Board; 4,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

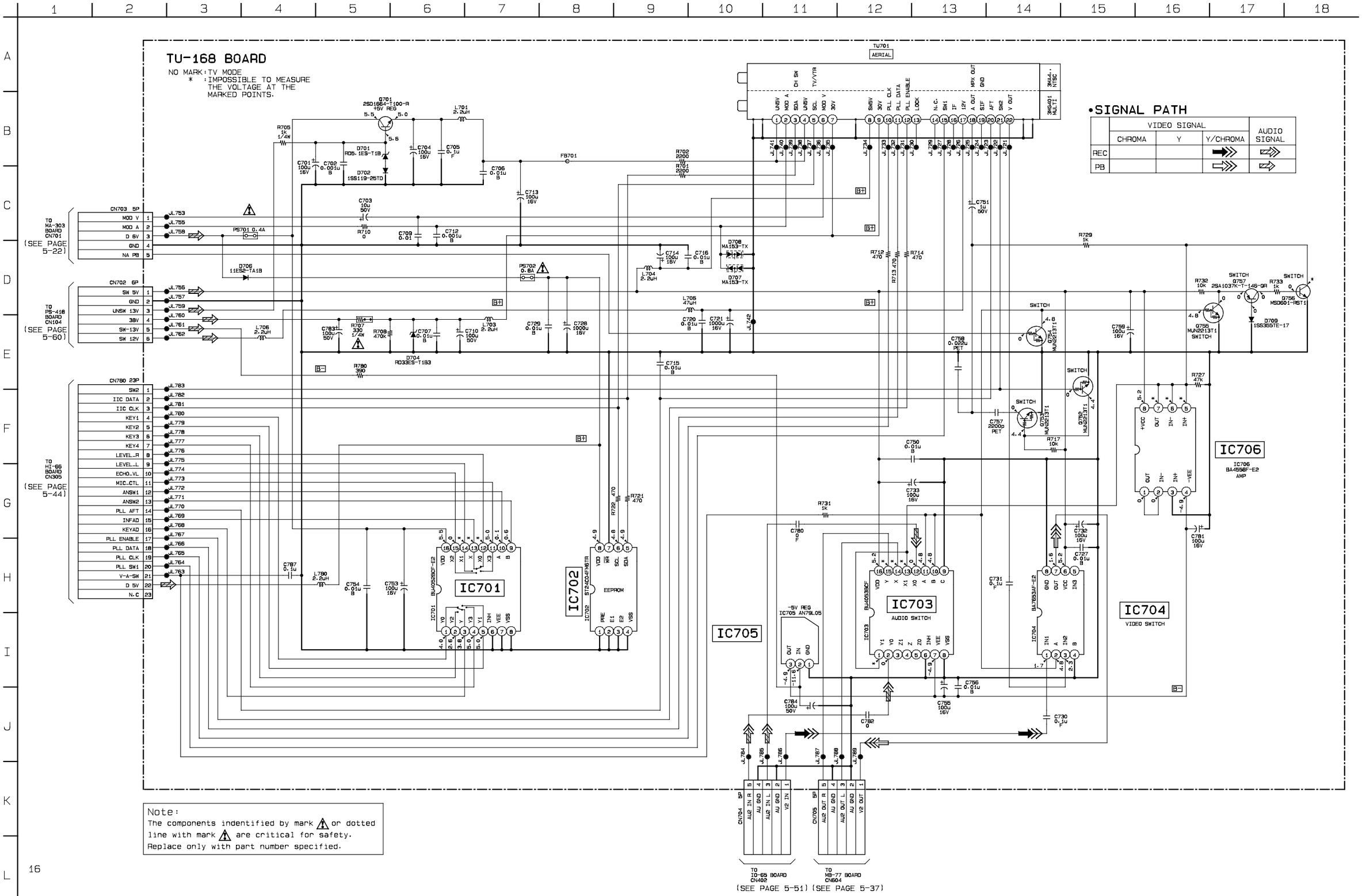


IO-65 BOARD

CN401	D-2
CN402	D-3
D401	A-1
D402	A-1
D403	B-6
D404	B-5
D405	B-4
D406	B-4
D407	B-2
D408	A-1
D409	C-2
D410	C-3
D411	C-3
D412	C-2
D413	C-4
D414	D-5
D415	C-4
D416	C-3
Q401	A-1
Q402	B-5

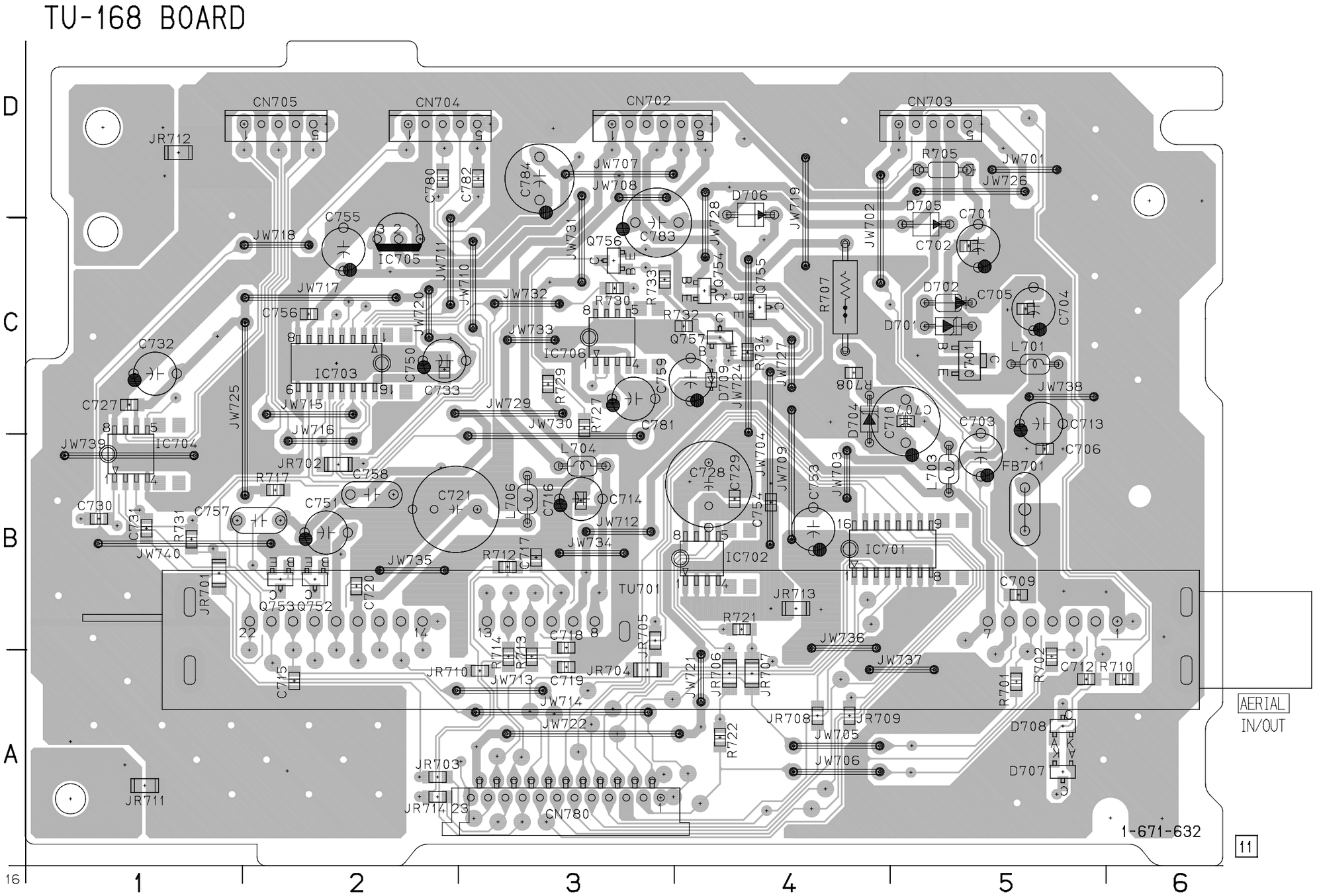
TU-168 (TUNER) SCHEMATIC DIAGRAM

— Ref. No. TU-168 Board; 7,000 Series —



TU-168 (TUNER) PRINTED WIRING BOARD
— Ref. No. TU-168 Board; 7,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

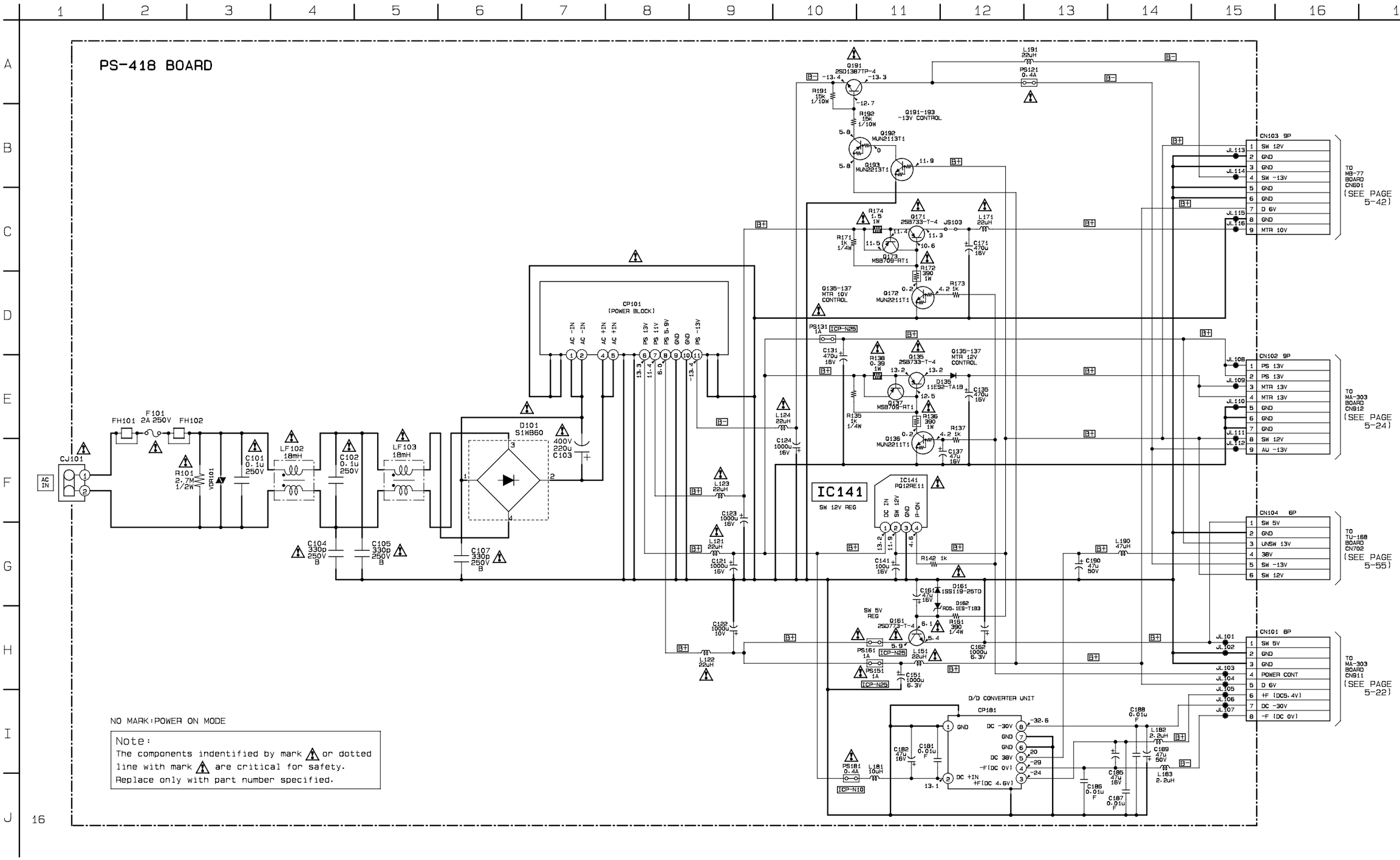


TU-168 BOARD

CN702	D-3
CN703	D-5
CN704	D-2
CN705	D-2
CN780	A-3
D701	C-5
D702	C-5
D704	C-4
D705	D-5
D706	D-4
D707	A-5
D708	A-5
D709	C-4
IC701	B-5
IC702	B-4
IC703	C-2
IC704	B-1
IC705	C-2
IC706	C-3
Q701	C-5
Q752	B-2
Q753	B-2
Q754	C-4
Q755	C-4
Q756	D-3
Q757	C-4

PS-418 (POWER SUPPLY) SCHEMATIC DIAGRAM

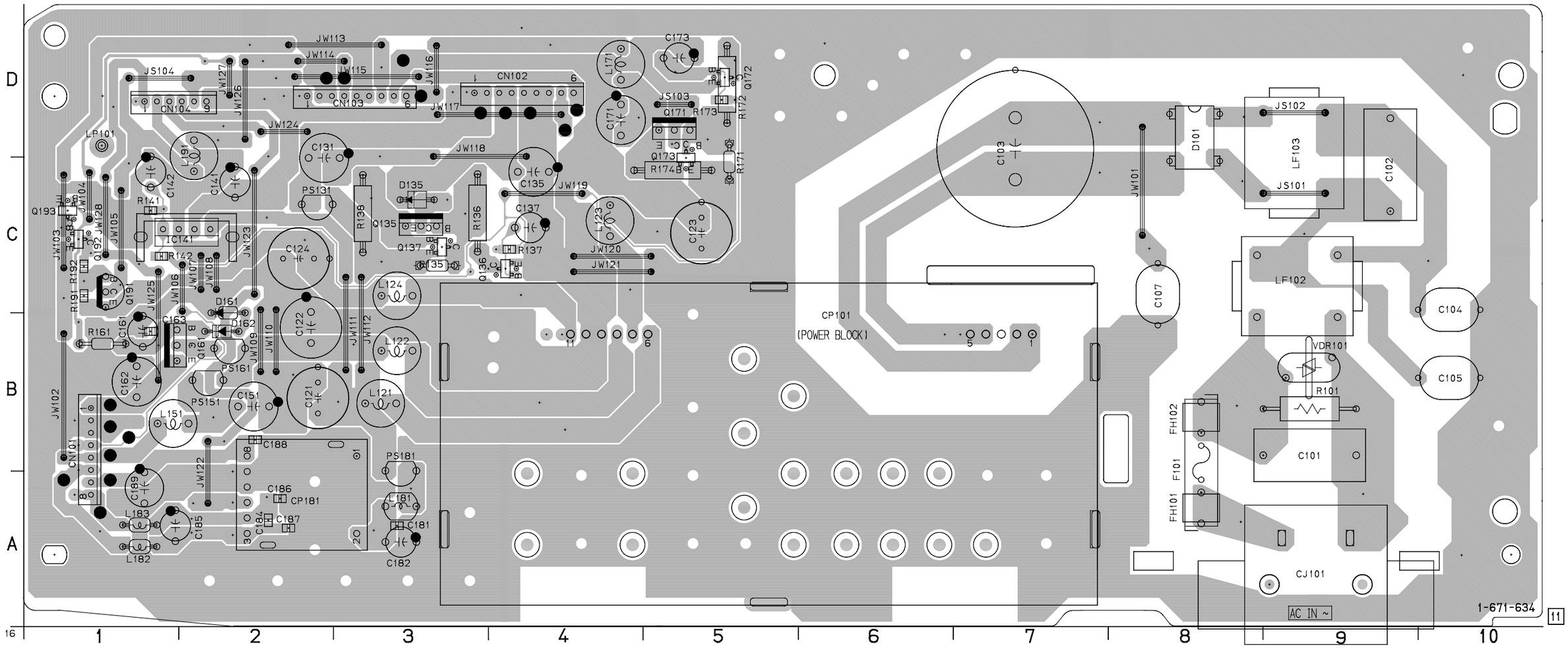
— Ref. No. PS-418 Board; 6,000 Series —



PS-418 (POWER SUPPLY) PRINTED WIRING BOARD
— Ref. No. PS-418 Board; 6,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

PS-418 BOARD



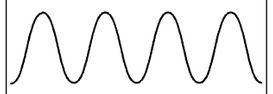
PS-418 BOARD

CN101	B-1
CN102	D-4
CN103	D-3
CN104	D-2
D101	D-8
D161	C-2
D162	B-2
IC141	C-2
Q135	C-3
Q136	C-4
Q161	B-2
Q171	D-5
Q172	D-5
Q173	D-5
Q191	C-1
Q192	C-1
Q193	C-1

WAVEFORMS

CD-169 BOARD

① IC301 ㊶ C-BAR

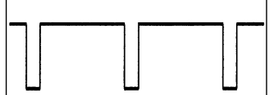


5.2Vp-p (10MHz)

② IC305 ② C-BAR

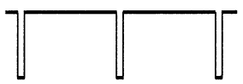
2.5Vp-p (28.63MHz)

③ IC305 ㊷ C-BAR



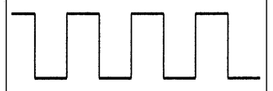
5Vp-p (H)

④ IC305 ㊸ C-BAR



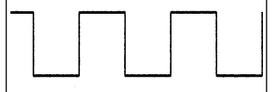
5Vp-p (V)

⑤ IC305 ⑩ C-BAR



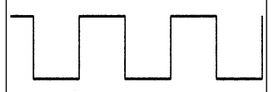
5Vp-p (44.1kHz)

⑥ IC305 ⑫ C-BAR



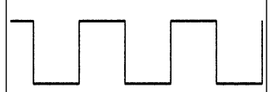
5Vp-p (2.1MHz)

⑦ IC310 ㉔ C-BAR



1.3Vp-p (H)

⑧ IC310 ㊻ C-BAR



5.6Vp-p (27MHz)

C-BAR : Color-bar mode

BD-21 BOARD

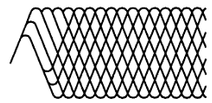
① IC101 ㉗ PB

500mVp-p

② IC101 ㉙ PB

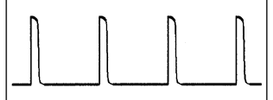
200mVp-p

③ IC101 ㊱ PB



1.3Vp-p

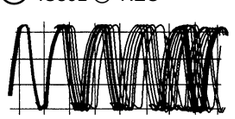
④ IC101 ㊻ PB



2.6Vp-p (7.5µsec)

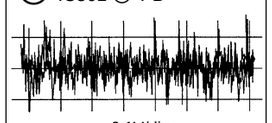
RP-233 BOARD

① IC501 ④ REC



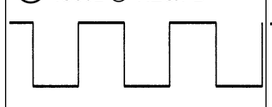
1V/div
1µs/div

⑤ IC501 ㉔ PB



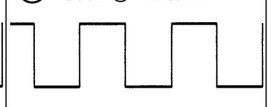
0.1V/div
20µs/div

② IC501 ⑰ REC/PB



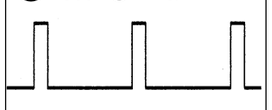
5.0Vp-p (V)

⑥ IC501 ㉖ REC/PB



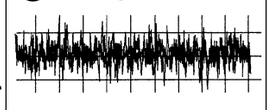
5.0Vp-p (V)

③ IC501 ⑱ REC/PB



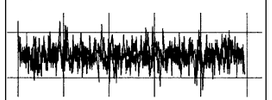
2.4Vp-p (H)

⑦ IC501 ㉗ PB



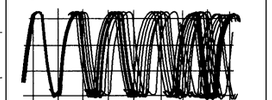
0.5V/div
20µs/div

④ IC501 ㉒ PB



0.5V/div
20µs/div

⑧ IC501 ㉘ REC



0.02V/div
0.1µs/div

HI-66 BOARD

① IC201 ㉛ REC/PB

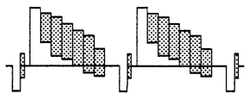
0.8Vp-p (16MHz)

MB-77 BOARD

① IC501 ㉜ REC/PB

5.8Vp-p (33.87MHz)

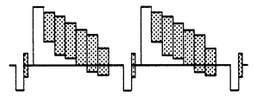
② IC751 ⑦ REC/PB



1.0Vp-p (H)

MA-303 BOARD (VIDEO)

① IC302 ⑦ REC

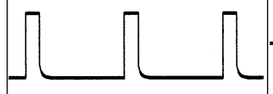


1.1Vp-p (H)

⑥ IC302 ㉜ REC/PB

0.6Vp-p (4.43MHz)

② IC302 ⑨ REC/PB

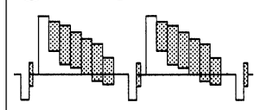


5.0Vp-p (H)

⑦ IC302 ㊳ REC

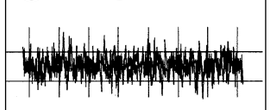
0.4Vp-p (H)

③ IC302 ⑪ PB



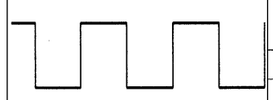
2.3Vp-p (H)

⑧ IC302 ㊳ PB



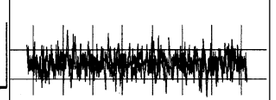
0.5V/div
20µs/div

④ IC302 ⑫ REC/PB



4.0Vp-p (V)

⑨ IC302 ㊸ PB



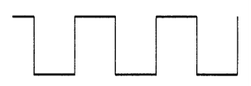
0.5V/div
20µs/div

⑤ IC302 ㉗ REC/PB

0.5Vp-p (3.58MHz)

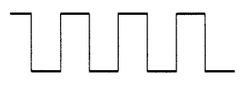
MA-303 BOARD (SERVO/SYSTEM)

⑩ IC201 ① REC/PB



5Vp-p (V)

⑰ IC201 ⑦⓪ REC/PB



4.4Vp-p (1.56kHz)

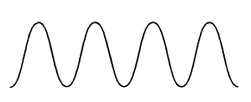
⑪ IC201 ⑦ REC

5Vp-p (V)

⑱ IC401 ② REC/PB

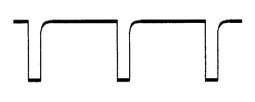
2.8Vp-p (17.7MHz)

⑫ IC201 ㊷ REC/PB



4.4Vp-p (16MHz)

⑲ IC401 ④ REC/PB

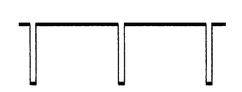


5.0Vp-p (H)

⑬ IC201 ⑥⑥ REC/PB

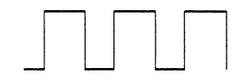
4Vp-p (H)

⑳ IC401 ⑦ REC/PB



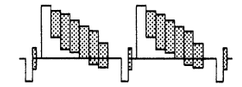
5.0Vp-p (V)

⑭ IC201 ⑥⑦ PB



5Vp-p (V)

㉑㉒ IC401 ⑯⑱ REC/PB

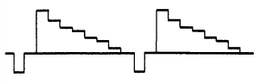


2.0Vp-p (H)

⑮ IC201 ⑥⑧ REC/PB

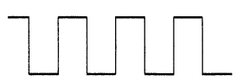
5Vp-p (V)

㉓ IC401 ⑳ REC/PB



1.8Vp-p (H)

⑯ IC201 ⑥⑨ REC/PB



5Vp-p (300Hz)

6-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-303 BOARD IC201)

Signal	Pin No.	I/O	STOP FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC • PAUSE
$\overline{\text{VPB}}$	IC201 ㉓	O	H	H	H	L	L	L	L	L	L	H	H
RF SWP	IC201 ①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	IC201 ②	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
$\overline{\text{SP}}$	IC201 ㉒	O	*4	*4	*4	*5	*5	*5	*5	*5	*5	*4	*4
$\overline{\text{SP}}$/EP/LP	IC201 ⑲	O	*4	*4	*4	*5	*5	*5	*5	*5	*5	*4	*4
V SYNC	IC201 ㊻	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
CTL REC	IC201 ㊹	O	L	L	L	L	L	L	L	L	L	H	L
JOG	IC201 ⑤	O	L	L	L	L	H	H	H	H	H	L	L
ORC SETTEI	IC201 ㉕	O	L	L	L	L	L	L	L	L	L	*7	*7
$\overline{\text{NTSC}}$	IC201 ㉔	O	*8	*8	*8	*9	*9	*9	*9	*9	*9	*8	*8

*1. Synchronized with drum rotation. 25 Hz (PAL)/30 Hz (NTSC) 50% duty pulse.
*2. Normally "L". "H" when CTL signal is not generated.
*3. V period "H" pulse.
*4. Selected by REC mode. SP mode: "L"
*5. Selected according to the tape recording mode.
*6. Composite Sync signal (positive).
*7. "H" while APC is set.
*8. Selected by REC mode. "L" in NTSC mode.
*9. Selected by the tape recording mode. "L" to the NTSC mode.

Mode / Signal	SP	LP	EP
$\overline{\text{SP}}$ ㉒	L	M	H
$\overline{\text{SP}}$/EP/LP ⑲	L	Hi-Z	H

6-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-303 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	CUE	x 2	REVIEW	REC	REC • PAUSE	PB INDEX WRT/ERS
REC CTL	IC201 ⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	
$\overline{\text{CAP STOP}}$	IC201 ㉟	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	IC201 ㊾	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	IC201 ㊹	O	L	L	L	L	L	L	L	L	L	L	L	H	L	H
CTL INDEX	IC201 ㊻	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
$\overline{\text{PB CTL}}$	IC201 ㊼	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRM PG	IC201 ㊽	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
DRM FG	IC201 ㊾	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8	
CAP FG	IC201 ㊿	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L	
CAP DA	IC201 ㊸	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10	
DRM DA	IC201 ㊹	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	
CTL STEP	IC201 ㊻	O	L	L	L	L	L	L	L	*11	L	L	L	L	L	

*1. 25 Hz (PAL)/30 Hz (NTSC) pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stop.
*5. Unstable period pulse.
*6. Pulse of period in proportion to tape speed.
*7. 25 Hz (PAL)/30 Hz (NTSC) pulse.
*8. 300 Hz (PAL)/360 Hz (NTSC) pulse.
*9. Pulse at tape running.
*10. Approx. 2 msec period "H" or "L" pulse.
*11. Approx. 1.5 msec period "H" or "L" pulse.
*12. Approx. 3 msec period "H" or "L" pulse.
*13. "H" when FWD direction STEP drive.

6-3. SYSTEM CONTROL – MECHANISM INTERFACE (MA-303 BOARD IC201)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB • PAUSE	SLOW	x 2	CUE	REVIEW	REC	PB • PAUSE
CAM LOAD	IC201 ㊳	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM UNLOAD	IC201 ㊲	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
CAM 12V	IC201 ㉛	O		H	L	H	L											
MODE1	IC201 ㉚	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE2	IC201 ㉙	I	L	L	L	*1	*1	L	L	L	H	H	H	H	H	H	H	H
MODE3	IC201 ㉘	I	L	L	L	*1	*1	H	H	H	L	H	H	L	L	H	L	H
MODE4	IC201 ㉗	I	L	H	H	*1	*1	H	L	L	L	L	L	L	L	L	L	L
C IN (REC PRF)	IC201 ㉜	I	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
TREEL FG	IC201 ㊹	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
SREEL FG	IC201 ㊸	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	IC201 ㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP TRQ1	IC201 ㉞	O (O.D)											*1					
CAP TRQ2	IC201 ㉝	O (O.D)										L	*1					L
CAP TRQ3	IC201 ⑧	O (O.D)							H	H			*1		H	H		
$\overline{\text{CAP STOP}}$	IC201 ㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	IC201 ㊾	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	IC201 ㊸	O																
T SENS	IC201 ㊷	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	IC201 ㊶	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainty.
*2. "L" when erasing protection tab is bent, "H" when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse at tape running.
*6. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.

6-4. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-303 BOARD IC201)

Signal	Pin No.	I/O	I/O level
$\overline{\text{ASURA RESET}}$	IC201 ㊵	I	Normally "H", "L" when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	IC201 ㊹	I	Chip select signal from timer microprocessor. V period "L" pulse.
S IN 0	IC201 ㊺	I	Serial communication data from timer microprocessor. V period "L" pulse.
S OUT 0	IC201 ㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
S CLK	IC201 ㊼	I	Serial communication clock with timer microprocessor. V period "L" pulse.

6-5. SYSTEM CONTROL – Hi-Fi AUDIO BLOCK INTERFACE (MA-303 BOARD IC201)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC • PAUSE
AF ENV	IC201 ㊺	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	IC201 ⑰	O (O.D)	L	L	L	L	H	H	H	H	H	L	L
$\overline{\text{NAREC P}}$	IC201 ⑯	O	L	L	L	L	L	L	L	L	L	H	L
AF REC $\overline{\text{P}}$	IC201 ④	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	IC201 ㊿	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	IC201 ㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 25 Hz (PAL)/30 Hz (NTSC) 50% duty pulse approx. 5 msec delayed from RF SWP.

6-6. SYSTEM CONTROL – NORMAL AUDIO BLOCK INTERFACE (MA-303 BOARD IC201)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC • PAUSE
NA PB	IC201 ㊽	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	IC201 ⑰	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
$\overline{\text{SP}}$	IC201 ㊷	O	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2
$\overline{\text{NAREC P}}$	IC201 ⑯	O	L	L	L	L	L	L	L	L	L	H	L
$\overline{\text{FULL ERS}}$	IC201 ㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 25 Hz (PAL)/30 Hz (NTSC) 50% duty pulse approx. 5 msec delayed from RF SWP.
*2. Selected by REC mode selector. SP mode: "L".
*3. Selected by tape recording mode. SP mode: "L".

6-7. AV CONTROL – INPUT SELECTION BLOCK INTERFACE (MB-77 BOARD IC705)

1. Self Duet

(0: 0V, 1: 9V)

Q0 (S.D.)	
IC705 ④	
0	Self duet ON & KARAOKE OFF
1	Self duet OFF

2. B. B. Audio DAC Emphasis

(0: 0V, 1: 5V)

Q1 (EMPH)	
IC705 ⑤	
0	Emphasis ON
1	Emphasis OFF

3. External Input Selection *1

(0: 0V, 1: 7 to 8V)

Q2 (INB)	Q3 (INA)	
IC705 ⑥	IC705 ⑦	
0	0	LINE-1 IN
0	1	LINE-2 IN
1	0	VCD REC (only KARAOKE mode)
1	1	Not used

*1. Video and audio are common and controlled at the same time.

4. Microphone direct sound mixer ON/OFF

(0: 0V, 1: 9V)

Q4 ($\overline{\text{MICDRYON}}$)	
IC705 ⑧	
0	Mixes direct sound. (when KARAOKE ON)
1	Does not mix direct sound.(when KARAOKE OFF)

5. Surround Setting

(0: 0V, 1: 3V)

Q5 ($\overline{\text{SURR1}}$)	Q6 ($\overline{\text{SURR2}}$)	Q7 ($\overline{\text{B. B.}}$)	
IC705 ⑨	IC705 ⑩	IC705 ⑪	
0	0	1	Pseudo stereo
0	1	0	Surround (A)
1	1	1	OFF

*2, *3. The output select switches given in 6 and 7 are used for selecting five sources and as well for the following switching;

6. L-ch Output Selection *2

(0: 0V, 1: 9V)

Q8 (AOUTC)	Q9 (AOUTB)	Q10 (AOUTAL)	
IC705 ⑫	IC705 ⑬	IC705 ⑭	
0	0	0	L-ch of VCD
0	0	1	R-ch of VCD
0	1	0	L-ch of surround
0	1	1	Not used (R-ch of surround)
1	0	0	L-ch of VHS PB
1	0	1	L-ch of KARAOKE (excluding surround)
1	1	0	L-ch of EE (external input)
1	1	1	Not used (mute = GND)

7. R-ch Output Selection *3, *4

(0: 0V, 1: 9V)

Q8 (AOUTC)	Q9 (AOUTB)	Q11 (AOUTAR)	
IC705 ⑫	IC705 ⑭	IC705 ⑮	
0	0	0	L-ch of VCD
0	0	1	R-ch of VCD
0	1	0	Not used (L-ch of surround)
0	1	1	R-ch of surround
1	0	0	R-ch of VHS PB
1	0	1	R-ch of KARAOKE (excluding surround)
1	1	0	R-ch of EE (external input)
1	1	1	Not used (mute = GND)

*4. Q8 and Q9 in common with L-ch.

6-8. SERVO/SYSTEM CONTROL MICROPROCESSOR PORT FUNCTION DESCRIPTION (MA-303 BOARD IC201 CXP87360-048Q)

Pin No.	Pin Name	I/O	Function
1	RF SWP	O	RF switching pulse output.
2	QVD	O	Quasi VD pulse output.
3	QHD ENBL	O	Quasi HD voltage level control.
4	AF REC $\overline{P}$	O	"H" output when hi-fi audio REC.
5	JOG	O	"H" when trick play mode.
6	PAL60	O	NTSC PB control signal. "H" when NTSC PB on PAL TV.
7	REC CTL	O	REC CTL signal output.
8	CAP TRQ3	O	Capstan current control.
9	APC2	I/O	APC control terminal 2.
10	APC1	I/O	APC control terminal 1.
11	SCORE1	I	Fixed to L.
12	SCORE2	I	Fixed to L.
13	NC	–	Not used.
14	NC	–	Not used.
15	NC	–	Not used.
16	$\overline{\text{NA REC P}}$	I/O	Normal audio recording mode. H : recording mode.
17	A MUTE	O	"H" when audio mute.
18	MESECAM	I/O	"H" in MESECAM mode.
19	$\overline{\text{SP}}$/EP/LP : HiZ	I/O	"L" output when SP mode. "H" output when EP mode. Input setting is LP mode.
20	YNR	I/O	YNR control.
21	AMS	I	KARAOKE playback sound blank detect input.
22	NC	–	Not used.
23	$\overline{\text{VPB}}$	O	Video system playback mode. "L" when playback.
24	$\overline{\text{NTSC}}$	O	"H" : PAL mode. "L" : NTSC mode.
25	NC	–	Not used.
26	NC	–	Not used.
27	MODE4	I	Mechanism section CAM encoder input.
28	MODE3	I	Mechanism section CAM encoder input.
29	MODE2	I	Mechanism section CAM encoder input.
30	MODE1	I	Mechanism section CAM encoder input.
31	CAM 12V	O	CAM motor reference voltage.
32	T/E LED	O	T/E LED output.
33	$\overline{\text{CAP TRQ2}}$	O	Capstan current control signal 2. L: FF/REW to STOP.
34	$\overline{\text{CAP TRQ1}}$	O	Capstan current control signal 1. L: SLOW speed down.
35	$\overline{\text{CAP STOP}}$	O	Capstan STOP signal output.
36	$\overline{\text{FULL ERS}}$	O	Full erase control.
37	CAM UNLOAD	O	Loading motor rotating direction control.
38	CAM LOAD	O	Loading motor rotating direction control.
39	MP	I	Fixed to L.

Pin No.	Pin Name	I/O	Function
40	$\overline{\text{ASURA RESET}}$	I	System reset input.
41	VSS	–	GND.
42	XTAL	–	System clock. (16 MHz)
43	EXTAL	–	
44	$\overline{\text{ASURA CS}}$	I	S/S microcomputer chip select signal.
45	S IN 0	I	Serial communication signal.
46	S OUT 0	O	Serial communication signal.
47	$\overline{\text{SCLK}}$	O	Serial communication signal.
48	REC	O	Supply for HEAD amp. recording
49	RF SWP	O	Video head switching position adjustment.
50	RF ENV	I	Video playback signal envelope.
51	AF SW POS	I	Hi-Fi switching position adjustment.
52	AVSS	–	UNSW GND.
53	AVREF	–	AD port reference input UNSW 5V.
54	AVDD	–	UNSW 5V.
55	AF ENV	I	Hi- Fi audio playback signal envelope.
56	HF ADJ	I	ADJ mode set. 0V : Hi-Fi Adj
57	MIC LEVEL	I	Mic voltage level input (for V. assist, SCORE function)
58	SOUND LEVEL	I	Sound voltage level input (for SCORE function)
59	NT PB SW	I	NTSC PB mode set. 0V : 3.58NTSC, 2.5V : 4.43NTSC, 5V : on PAL TV.
60	APC ERROR	I	APC3 feedback voltage input.
61	S SENS	I	Supply end sensor input.
62	T SENS	I	Take-up end sensor input.
63	SREEL FG	I	S side reel FG input.
64	TREEL FG	I	T side reel FG input.
65	NC	–	Not used.
66	V SYNC	I	Composite sync input.
67	$\overline{\text{PB CTL}}$	I	Playback CTL input.
68	DRM PG	I	Drum PG input.
69	DRM FG	I	Drum FG input.
70	CAP FG	I	Capstan FG input.
71	NC	–	Not used.
72	POWER CONT CD	O	Power control signal.
73	CAP DA	O	Capstan error D/A output.
74	DRM DA	O	Drum error D/A output.
75	ORC SETTEI	O	"H" when ORC measurement.
76	POWER CONT	O	Power supply control signal.
77	NC	–	Not used.
78	NT JUDGE	I	4.43/3.58 judge input.

Pin No.	Pin Name	I/O	Function
79	CAP RVS	O	Capstan reverse control H when reverse.
80	SO1	I/O	Signal for serial communication.
81	$\overline{SCK1}$	I/O	Signal for serial communication.
82	C IN/REC PRF	I	Erasing protection bab, cassette in detection.
83	NC	–	Not used.
84	PWM	O	PWM output (14bit) for APC2.
85	NC	I	Not used.
86	NC	–	Not used.
87	NC	–	Not used.
88	VSS	–	GND.
89	VDD	–	5V.
90	NC	–	Not used.
91	VCD/$\overline{VHS}$	O	"L" output when VHS mode.
92	$\overline{SP}$	O	Tape speed select.
93	3.58NTSC	O	Video selection signal. ("H" : 3.58 X'tal)
94	CTL REC	O	"H" : CTL write.
95	CTL STEP	O	CTL amp, step operation control.
96	CTL INDEX	O	CTL index signal input.
97	NC	–	Not used.
98	NA PB	O	Audio output control signal. "H" : Normal audio playback.
99	STEP PLS	O	Step pulse "H" when capstan step driving.
100	AF SWP	O	AF switching pulse output.

6-9. DISPLAY/FUNCTION CONTROL MICROPROCESSOR PORT FUNCTION DESCRIPTION (HI-66 BOARD IC201 CXP82940-021Q)

Pin No.	Pin Name	I/O	Function
1	V SYNC	I	Composite sync input.
2	QINT	I	QINT signal of CD block communication. (MECH→Master)
3	SYNC DET	I	Sync detect signal from OSD IC.
4	RMC	I	Remote control signal receive terminal.
5	K REDY	I	KARAOKE DSP ready signal.
6, 7	NC	–	Not used.
8	SRDT1	I/O	Serial-parallel signal for AVSW.
9	INSW	I	CD tray chucking data.
10	ASURA CLK	O	ASURA clock.
11	ASURA SI	I	ASURA serial communication input.
12	ASURA SO	O	ASURA serial communication output.
13	SR CLK	I/O	Serial communication clock.
14	CD RESET	O	CD and KARAOKE IC reset.
15	SO	O	Serial communication output. (to KARAOKE IC and OSD IC)
16	KEY 4	I	Key 4 group input.
17	KEY 3	I	Key 3 group input.
18	ECHO VL	I	Echo volume input.
19	LEVEL L	I	Level meter L input.
20	LEVEL R	I	Level meter R input.
21	MIC CTRL	I	MIC control input.
22	KEY 2	I	Key 2 group input.
23	KEY 1	I	Key 1 group input.
24	AVDD	–	D 6V.
25	AV REF	–	A/D converter reference voltage input terminal.
26	LOD OUT	O	CD tray open motor switch.
27	P MUTE	O	Power ON/OFF mute.
28	K LAT	O	KARAOKE DSP latch.
29	LODIN	O	CD tray close motor switch.
30	AVSS	–	GND.
31	EXTAL	–	System clock. (16 MHz)
32	XTAL	–	
33	VSS	–	GND.
34	RST	I	Reset terminal.
35	CMD0	I/O	Command of CD block communication. (Master ⟷ MECHA)
36	CMD1	I/O	Command of CD block communication. (Master ⟷ MECHA)
37	CMD2	I/O	Command of CD block communication. (Master ⟷ MECHA)
38	CMD3	I/O	Command of CD block communication. (Master ⟷ MECHA)
39	SACK	I	ACK of CD block communication. (Master ⟷ MECHA)
40	MREQ	O	REQ of CD block communication. (Master ⟷ MECHA)

Pin No.	Pin Name	I/O	Function
41	OUT SW	I	CD tray open motor switch.
42	CD MUTE	O	DAC mute for CD.
43	VFDP	–	–30V
44 – 63	S0 – S19	O	Segment 1 to 20.
64 – 71	G0 – G7	O	Grid 1 to 8.
72	VDD	–	D 6V.
73	TX	–	Not used.
74	TEX	–	GND.
75	NC	–	Not used.
76	SRDT2/NTPAL-1	O	Serial-parallel signal output for LED display/Destination select data output.
77	ASURA RST	O	ASURA reset.
78	ASURA CS/NTPAL-2	O	ASURA chip select.
79	OSD CS	O	OSD IC chip select.
80	NC	–	Not used.

6-10. VIDEO-CD MECHANISM CONTROL MICROPROCESSOR PORT FUNCTION DESCRIPTION (CD-169 BOARD IC301 HD6433032SK07F)

Pin No.	Pin Name	I/O	Function
1	CMD0	I/O	Input/output terminal exchanging data bus 0 with system controller.
2	CMD1	I/O	Input/output terminal exchanging data bus 1 with system controller.
3	CMD2	I/O	Input/output terminal exchanging data bus 2 with system controller.
4	CMD3	I/O	Input/output terminal exchanging data bus 3 with system controller.
5	SACK	O	Outputs command acknowledge to system controller.
6	QINT	O	Outputs command output pulses to system controller.
7	CHECK-LED	O	Check LED control.
8	DF-XLAT	O	Serial data latch pulse output to Audio D/A converter. (Not used. open)
9	P90/TXD	–	Not used.
10	SUB Q	I	Sub Q 80bit input.
11	SQCK	O	SQSO readout clock output.
12	VSS	–	GND.
13	D0	I/O	Data bus input/output
14	D1	I/O	
15	D2	I/O	
16	D3	I/O	
17	D4	I/O	
18	D5	I/O	
19	D6	I/O	
20	D7	I/O	
21	VCC	–	Connect to the power supply. (+5V)
22	A0	O	Address bus output.
23	A1	O	
24	A2	O	
25	A3	O	
26	A4	O	
27	A5	O	
28	A6	O	
29	A7	O	
30	VSS	–	GND.
31	A8	O	Address bus output.
32	A9	O	
33	A10	O	
34	A11	O	
35	A12	O	
36	A13	O	
37	A14	O	
38	A15	O	
39	A16	O	

Pin No.	Pin Name	I/O	Function
40	A17	O	Address bus output.
41	A18	O	
42	A19	O	
43	MPEG	I	MPEG wait input.
44	MD0	I	Operation mode setting terminal. (Connected to +5V)
45	MD1	I	Operation mode setting terminal. (Connected to ground)
46	Ø	O	System clock output (Not used).
47	$\overline{\text{STBY}}$	I	Shifts to the hardware standby mode when the standby terminal becomes "Low". (Unable to use H level fixed) (Connected to +5V)
48	$\overline{\text{RESET}}$	I	Set into reset when the reset input pin becomes "Low".
49	NM1	I	Requests mask disable interruption. (Unable to use H level fixed) (Connected to +5V)
50	VSS	–	GND.
51	EXTAL	I	Connected to the Crystal oscillator. The EXTAL pin is also able to input external clocks.
52	XTAL	I	Connected to the Crystal oscillator.
53	VCC	–	Connect to the power supply. (+5V)
54	$\overline{\text{AS}}$	O	When the address strobe pin is "Low", indicates that address outputs on the address bus are valid.
55	$\overline{\text{RD}}$	O	When the read pin is "Low", indicates that the external addresses space is in the read state.
56	$\overline{\text{WR}}$	O	When the read pin is "Low", indicates that the external addresses space is in the write state and the data bus are valid.
57	$\overline{\text{RESO}}$	O	Reset output (Not used).
58	AVSS	–	A/D converter (pin62-69) ground.
59	TEST0	I	Test 0 input.
60	TEST1	I	Test 1 input.
61	TEST2	I	Test 2 input.
62	SENS	I	Internal state (SENSE) monitor input from BD-21 board.
63	DAC-SELECT	I	Audio D/A converter select mode setting terminal.
64	NPIN	I	NTSC/PAL output mode setting terminal.
65	CXD1853-SELECT	I	CXD1853 select mode setting terminal. (H : CXD1853 used)
66	$\overline{\text{VREQ}}$	I	Not used.
67	VREF	I	A/D converter (pin62-69) reference voltage input. (connected to +5V)
68	AVCC	–	A/D converter (pin62-29) power supply. (connected to +5V)
69	CXD1913LTH	O	Serial data latch pulse output to CXD1913. (Digital NTSC/PAL encoder)
70	XHIRQ	I	Interruption request input from MPEG decoder.
71	SCOR	I	Subcode sync input from BD-21 board.
72	MREQ	I	Inputs command request from system controller.

Pin No.	Pin Name	I/O	Function
73	DATA	O	Serial data output to BD-21 board, CXD1913 and CXD8567.
74	AMUTE	O	Mute switching to BD-21 board.
75	LDON	O	Laser diode ON/OFF output.
76	XLT	O	Latch output to BD-21 board.
77	SCLK	O	SENS serial data reading clock output to BD-21 board.
78	CLK	O	Serial data clock output to BD-21 board and CXD1913.
79	NP OUT	O	NTSC/PAL output select.
80	2545RST	O	Digital signal processor. (CXD2545Q system reset)

6-11. MPEG DECODER PORT FUNCTION DESCRIPTION (CD-169 BOARD IC305 CXD1852Q)

Pin No.	Pin Name	I/O	Function
1	VSS	–	GND.
2	XTL0O	O	Video decoder master clock pin. Input the XTL0I clock or connect an oscillator between XTL0I and XTL0O. The recommended frequencies are 27 MHz, 28.6363 MHz (NTSC 8fsc), and 35.4686 MHz (PAL 8fsc).
3	XTL0I	I	
4	VDD	–	+5V power supply.
5	HA2	I	Address input pin. In some cases, serves as the control signal and data input according to the setting of the control mode.
6	HA3	I	
7	HD0	I/O	Data input/output.
8	HD1	I/O	
9	HD2	I/O	
10	HD3	I/O	
11	HD4	I/O	
12	HD5	I/O	
13	HD6	I/O	
14	VDD	–	+5V power supply.
15	VSS	–	GND.
16	HD7	I/O	Data input/output.
17	MA3	O	Address signal pin. Connect to the DRAM address pin with the same number.
18	MA4	O	
19	MA2	O	
20	MA5	O	
21	MA1	O	
22	VSS	–	GND.
23	MA6	O	Address signal pin. Connect to the DRAM address pin with the same number.
24	MA0	O	For test.
25	BC	I	
26	TCKI	I	
27	TDI	I	
28	TENAI	I	
29	TDO	I	
30	VST	I	For test. (Connect to ground)
31	VSS	–	GND.
32	MA7	O	Address signal pin. Connect to the DRAM address pin with the same number.
33	MA8	O	
34	XRAS	O	RAS signal pin. Connect to the RAS pin of the DRAM. Same for the 256Kw × 16b, 256Kw × 16b × 2, and 512Kw × 8b × 2 DRAM structures.
35	XMWE	O	WE signal pin. Connect to the WE pin of the DRAM.

Pin No.	Pin Name	I/O	Function
36	XCAS2 /MA9	O	CAS signal. Connect to the CAS pin of the DRAM so as to control the lower bytes of the upper word (256K to 512K-1) for the 256Kw × 16b × 2 DRAM structure. /Address signal pin. Connect to the DRAM address pin with the same number.
37	XCAS0	O	CAS signal. Connect to the CAS pin of the DRAM so as to control the lower bytes (MD0 to MD7) for 256Kw × 16b and 512Kw × 8b × 2 DRAM structures, and to control the lower bytes of the lower word (0 to 256K-1) for the 256Kw × 16b × 2 DRAM structure.
38	MD7	I/O	Data input/output signal pin. Connect to the DRAM data pin so that the lower and upper bytes of the data correspond to the CAS0 to CAS3 controls.
39	MD8	I/O	
40	MD6	I/O	
41	MD9	I/O	
42	MD5	I/O	
43	MD10	I/O	
44	VDD	–	+5V power supply.
45	VSS	–	GND.
46	MD4	I/O	Data input/output signal pin. Connect to the DRAM data pin so that the lower and upper bytes of the data correspond to the CAS0 to CAS3 controls.
47	MD11	I/O	
48	MD3	I/O	
49	MD12	I/O	
50	MD2	I/O	
51	MD13	I/O	
52	MD1	I/O	
53	MD14	I/O	
54	MD0	I/O	
55	MD15	I/O	
56	XOSDEN	I	OSD enable signal.
57	OSDB	I	OSD data input pin. When the XOSDEN input is L, the color registered in the register specified by this 3 inputs (3 bits) is output as the image data. (Connected to ground)
58	OSDG	I	
59	OSDR	I	
60	VDD	–	+5V power supply.
61	VSS	–	GND.
62	XVOE	I	Video output enable signal pin. When set to 'L', enables the image data output and DCLK output. When set to 'H', disables (high impedance). Output control can also be performed by writing in the register.
63	R/Cr0	O	Output pin of the R or Cr signal of the image data. MSB is R/Cr7. Synchronizes with DCLK.
64	R/Cr1	O	
65	R/Cr2	O	
66	R/Cr3	O	

Pin No.	Pin Name	I/O	Function
67	R/Cr4	O	Output pin of the R or Cr signal of the image data. MSB is R/Cr7. Synchronizes with DCLK.
68	R/Cr5	O	
69	R/Cr6	O	
70	R/Cr7	O	
71	G/Y0	O	Output pin of the G or Y signal of the image data. MSB is G/Y7. Synchronizes with DCLK.
72	G/Y1	O	
73	G/Y2	O	
74	VDD	–	+5V power supply.
75	VSS	–	GND.
76	G/Y3	O	Output pin of the G or Y signal of the image data. MSB is G/Y7. Synchronizes with DCLK.
77	G/Y4	O	
78	G/Y5	O	
79	G/Y6	O	
80	G/Y7	O	
81	B/Cb0	O	Output pin of the B or Cb signal of the image data. MSB is B/Cb7. Synchronizes with DCLK.
82	B/Cb1	O	
83	B/Cb2	O	
84	B/Cb3	O	
85	B/Cb4	O	
86	B/Cb5	O	
87	B/Cb6	O	
88	B/Cb7	O	
89	DCLK	I/O	Dot clock (DCLK) signal pin. The DCLK frequency is normally 13.5 MHz. The DCLK can be input from this pin or can be made by frequency-dividing (1/integer) the clock input from XTL0I.
90	VDD	–	+5V power supply.
91	VSS	–	GND.
92	HSYNC	I/O	Horizontal sync signal pin. When using the built-in sync generator, a signal is made by frequency-dividing the dot clock (DCLK). Serves as the input when not using the built-in sync generator.
93	VSYNC	I/O	Vertical sync signal pin. When using the built-in sync generator, a signal is made by frequency-dividing the DCLK. Serves as the input when not using the built-in sync generator.
94	FID /FHREF	I/O /O	Field determination signal signal. Odd field correspond to H and even field correspond to L. Serves as an output when the built-in sync generator is used, and as an input when not. /Signal obtained by frequency-dividing the clock input from XTL0I or XTLI. When the input clock is 8 fsc, it can be used as the horizontal sync signal phase comparison reference signal.

Pin No.	Pin Name	I/O	Function
95	CBLNK /FSC	I/O /O	Composite blanking signal pin. Serves as an output when the built-in sync generator is used, and as an input when not. /Signal obtained by frequency-dividing the clock input from XTL0I or XTLI. When the input clock is 8 fsc, it can be used as the fsc signal. (Not used. open)
96	CSYNC	O	Composite sync signal pin. A signal is made by frequency-dividing the DCLK. Cannot be input.
97	XSGRST	I	Sync generator reset signal pin. The signal generator is initialized by setting this pin to 'L'.
98	CLK0O	O	Outputs the frequency-divided clock of the clock input to XTL0I. The frequency dividing ratio can be selected from 1/2, 1/4, and 1/8.
99	DOUT	O	Digital output. (Not used. open)
100	DATO	O	Audio serial data output pin. Synchronizes with the clock input from FSXI.
101	LRCO	O	LR clock output pin. Outputs the clock input from the LRCI. (Not used. open)
102	BCKO	O	Bit clock output pin. Outputs the clock input from the BCKI. (Not used. open)
103	FSXI	I	Input 384fs (16.9344 MHz) or 768fs (33.8688 MHz).
104	VDD	–	+5V power supply.
105	VSS	–	GND.
106	XTL2O	O	CD-ROM decoder, audio decoder master clock. Input a clock to the XTL2I or connect an oscillator between XTL2I and XTL2O. The recommended frequency is 45 MHz. This clock is for the internal circuit. Does not synchronise with inputs and outputs.
107	XTL2I	I	
108	VDD	–	+5V power supply.
109	C2PO	I	C2 pointer input.
110	LRCI	I	LR clock input.
111	DATI	I	Serial data input.
112	BCKI	I	Bit clock input.
113	DOIN	I	Digital input signal.
114	XHCS	I	Register access chip select signal pin.
115	XHDT	I/O	Data acknowledge/wait signal pin for DMA transmission, register access, transparent memory access.
116	HRW	I	Register access control signal pin.
117	XHIRQ	O	Interrupt request signal.
118	XRST	I	Hardware reset input pin. When set to 'L', all registers and operations are reset and initialized.
119	HA0	I	Address input pin. In some cases, serves as the control signal and data input according to the setting of the control mode.
120	HA1	I	

6-12. VIDEO ENCODER PORT FUNCTION DESCRIPTION (CD-169 BOARD IC310 CXD1913Q)

Pin No.	Pin Name	I/O	Function
1	Y7	I	8-bit pixel data input pins (PD0 to 7).
2	Y6	I	When control register bit “PIF MODE”=“0”, serve as input pins for
3	Y5	I	multiplexed Y, Cb, Cr signals.
4	Y4	I	When control register bit “PIF MODE”=“1”, serve as input pins for Y signal.
5	VSS	–	Digital GND.
6	Y3	I	8-bit pixel data input pins (PD0 to 7).
7	Y2	I	When control register bit “PIF MODE”=“0”, serve as input pins for
8	Y1	I	multiplexed Y, Cb, Cr signals.
9	Y0	I	When control register bit “PIF MODE”=“1”, serve as input pins for Y signal.
10	VDD	–	Digital power supply.
11	C7	I/O	8-bit pixel data input pins/test data bus.
12	C6	I/O	When control register bit “PIF MODE”=“0”, these input pins cannot be used.
13	C5	I/O	When control register bit “PIF MODE”=“1”, serve as input pins for
14	C4	I/O	multiplexed Cb, Cr signals.
15	C3	I/O	
16	C2	I/O	In the test mode, used for internal circuit test data bus.
17	C1	I/O	The test mode is allowed to use only for device vendors.
18	C0	I/O	
19	VSS	–	Digital GND.
20	IREF	O	Reference current output pin. Connect resistor × 16 times (“16R”) of the output resistance value “R”.
21	VREF	I	Voltage reference input pin. Sets the output full-scale value.
22	AVDD1	–	Analog power supply.
23	AVSS1	–	Analog GND.
24	COMPO	O	10-bit D/A converter output. When control register bit “YC/YUV”=“1”, outputs the composite signal. When control register bit “YC/YUV”=“0”, outputs the color difference (V) signal.
25	VB	O	Connect to VSS with an approx. 0.1 µF capacitor.
26	VG	I	Connect to AVDD with an approx. 0.1 µF capacitor.
27	AVDD2	–	Analog power supply.
28	AVSS2	–	Analog GND.
29	YO	O	10-bit D/A converter output. (Not used. open) (Luminance (Y) signal output.)
30	AVDD3	–	Analog power supply.
31	AVSS3	–	Analog GND.

Pin No.	Pin Name	I/O	Function
32	CO	O	10-bit D/A converter output. (Not used. open) When control register bit “YC/YUV”=“1”, outputs the chroma (C) signal. When control register bit “YC/YUV”=“0”, outputs the color difference (U) signal.
33	TD10	I/O	Test data bus. Set to open. In the test mode, used for internal circuit test data bus. The test mode is allowed to use only for device vendors.
34	VDD	–	Digital power supply.
35	TD9	I/O	Test data bus. Set to open. In the test mode, used for internal circuit test data bus. The test mode is allowed to use only for device vendors.
36	TD8	I/O	
37	XTEST1	I	Test mode control input pin. Pulled-up. When these pins are “H”, CXD1913Q is not in the test mode. The test mode is allowed to use only for device vendors.
38	XTEST2	I	
39	XTEST3	I	
40	VSS	–	Digital GND.
41	TRST	I	Test mode reset input pin. During power on/reset, set to “L” for more than 40 clocks (SYSCLK).
42	VDD	–	Digital power supply.
43	TDI	I	Test mode control input pin. Pulled-up.
44	TMS	I	
45	TCK	I	Test mode control input pin. Fix at “H”.
46	TDO	O	Test data bus pin. Set to open.
47	VSS	–	Digital GND.
48	SI	I	The functions of this pin are selected by pin 64 XIICEN. When the XIICEN pin is “H”, sets into the SONY SIO mode, and becomes the SI serial data input pin. When the XIICEN pin is “L”, sets into the I^2C-BUS mode, and becomes the SDA input/output pin.
49	SCK	I	The functions of this pin are selected by pin 64 XIICEN. When the XIICEN pin is “H”, sets into the SONY SIO mode, and becomes the SCK serial clock input pin. When the XIICEN pin is “L”, sets into the I^2C-BUS mode, and becomes the SCL input pin.
50	XCS	I	The functions of this pin are selected by pin 64 XIICEN. Pulled-up. When the XIICEN pin is “H”, sets into the SONY SIO mode, and becomes the XCK chip select input pin. When the XIICEN pin is “L”, sets into the I^2C-BUS mode, and becomes the SA slave address selection input signal which selects the I^2C-BUS slave address.

Pin No.	Pin Name	I/O	Function
51	XVRST	I	Active “L” vertical sync reset input pin. Pulled-up. Used for synchronizing external vertical sync and internal vertical sync. When XVRST is “L”, the internal digital sync generator is reset according to the F1 state.
52	F1	I	Field ID input pin. When externally synchronizing with the XVRST signal, the field to be reset is determined by this signal. “H” indicates the first field. “L” indicates the second field.
53	VDD	–	Digital power supply.
54	XTEST4	I	Test mode control input pin. Pulled-up. When these pins are “H”, CXD1913Q is not s test mode. The test mode is allowed to use only for device vendors.
55	XRST	I	System reset input pin when active “L”. During power on/reset, set to “L” for more than 40 clocks (SYSCLK).
56	SYSCLK	I	System clock input pin. To generate the correct sub carrier frequency, precisely 27 MHz is required.
57	PDCLK	O	13.5 MHz pixel data clock output pin. This clock is obtained by 1/2 frequency-dividing SYSCLK. Used only in the 16-bit pixel data mode.
58	VSS	–	Digital GND.
59	VSYNC	O	V.sync signal output.
60	HSYNC	O	H.sync signal output.
61	SO	O	The functions of this pin are selected by pin 64 XIICEN. When the XIICEN pin is “H”, sets into the SONY SIO mode, and becomes the S0 serialout output pin. When the XIICEN pin is “L”, this pin is not used and sets into high impedance.
62	FID	O	Field ID output. When control register bit “FDS”=“1”, “L” indicates the first field and “H” indicates the second field. When control register bit “FDS”=“0”, “H” indicates the first field and “L” indicates the second field.
63	VDD	–	Digital power supply.
64	XIICEN	O	Serial interface mode selection input pin. Pulled-up. When “L”, Pins 48 to 50, and 61 set into the I^2C-BUS mode. When “H”, Pins 48 to 50, and 61 set into the SONY SOP mode.

6-13. KARAOKE/DIGITAL SOUND PROCESSOR PORT FUNCTION DESCRIPTION (MB-77 BOARD IC501 CXD2720Q)

Pin No.	Pin Name	I/O	Function
1	AVS0	–	Digital GND for DRAM.
2	VSS0	–	GND for digital system.
3	RVDT	I	Microcomputer interface data input.
4	SCK	I	Microcomputer interface shift clock input.
5	XLAT	I	Microcomputer interface latch input.
6	REDY	O	Microcomputer interface transmit permission signal output.
7	TRDT	O	Microcomputer interface serial data output. Normally “H”.
8	XWO	I	Window open input for synchronization.
9	XRST	I	System reset input terminal. “L” : reset.
10	VSS1	–	GND for digital system.
11	VDD0	–	+5V for digital system.
12	SO	O	Serial data output with one sampling for two channels.
13	XS24	I	Serial data 24 or 32 bit slot select. “L” to select 24 bit slot. (valid in slave mode)
14 – 19	TST0 – TST5	I	Test terminal. Normally fixed to “L”.
20	VSS2	–	GND for digital system.
21	AVS3	–	GND terminal for ch-3 A/D converter.
22	AIN3	I	Analog input terminal for ch-3 A/D converter. (for MIC)
23	AVD3	–	VDD terminal for ch-3 A/D converter.
24	AVD4	–	VDD terminal for ch-1 D/A converter.
25	AO1P	O	CH-1 D/A converter analog normal phase output.
26	AO1N	O	CH-1 D/A converter analog opposite phase output.
27	AVS4	–	GND terminal for ch-1 D/A converter.
28	AVS1	–	GND terminal for ch-1 A/D converter.
29	AIN1	I	Analog input terminal for ch-1 A/D converter.
30	AVD1	–	VDD terminal for ch-1 A/D converter.
31	XVDD	–	Digital VDD for master clock.
32	XTLO	O	System clock. (33.8688 MHz)
33	XTLI	I	
34	XVSS	–	Digital GND for master clock.
35	AVS2	–	GND terminal for ch-2 A/D converter.
36	AIN2	I	Analog input terminal for ch-2 A/D converter.
37	AVD2	–	VDD terminal for ch-2 A/D converter.
38	AVD5	–	VDD terminal for ch-2 D/A converter.
39	AO2N	O	CH-2 D/A converter analog opposite phase output.
40	AO2P	O	CH-2 D/A converter analog normal phase output.
41	AVS5	–	GND terminal for ch-2 D/A converter.
42	VSS3	–	GND terminal for digital system.
43	VDD1	–	VDD terminal for digital system.

Pin No.	Pin Name	I/O	Function
44 – 52	NC	–	Normally open.
53	VSS4	–	GND terminal for digital system.
54 – 68	NC	–	Normally open.
69	VSS5	–	GND terminal for digital system.
70	VDD2	–	VDD terminal for digital system.
71 – 79	NC	–	Normally open.
80	VSS6	–	GND terminal for digital system.
81	X768	I	Test input terminal. Normally fixed to “L”.
82	BFOT	O	Clock divided frequency output.
83	INVI	I	Test input terminal. Normally fixed to “L”.
84, 85	NC	–	Normally open.
86	SI	I	Serial data input with one sampling for two channels.
87	BCK	I/O	Serial bit transmit clock pin for serial input/output data SI and SO.
88	LRCK	I/O	Serial bit frequency clock pin for serial input/output data SI and SO.
89	XMST	I	BCK and LRCK master/slave mode select signal input. “L” : master mode.
90	VSS7	–	GND terminal for digital system.
91 – 98	NC	–	Normally open.
99	VDD3	–	VDD terminal for digital system.
100	AVD0	–	Digital VDD terminal for DRAM.

SECTION 7
ADJUSTMENTS

7-1. MECHANICAL ADJUSTMENTS

For the procedures how to adjust and check the mechanism, as well as how to replace mechanical parts, refer to the VHS Mechanical Adjustment Manual Ⅳ (H MECHANISM) (9-973-623-11).
However, for the procedures how to see the Track Shift mode, refer to the following text.

7-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 7-12 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

[Instruments for Use]

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30MHz or more, with delay mode (A prove 10 : 1 should be used unless otherwise specified.)
3) Frequency counter (8 digits or more)
4) PAL pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion rate meter
10) Modulation Analyzer
11) Alignment tape
    Part No. : H7099052H (MH-2)
12) Reference disc (YEDS-18)
    Part No. : 3-702-101-01

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown is the following diagram.

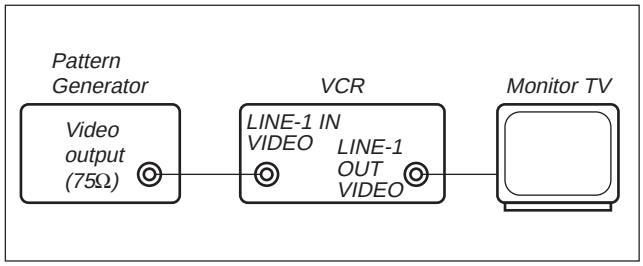


Fig. 7-2-1.

Unless otherwise specified, place the switches and controls of this unit in the following positions :

- INPUT SELECT (VHS) switch 1
- COLOR SYSTEM switch ..... PAL/AUTO
- TAPE SPEED switch* ..... SP

* : Remote commander

2-1-3. Check of Input Signal

Because the video signal obtained from the pattern generator is used as the adjustment signal for the adjustment, the video output signal is required to satisfy the specified value.

Unless otherwise specified, input PAL color bar.
Connect the oscilloscope to the picture input terminal (terminal board). And check that the synchronizing signal amplitude of the video signal is approximately 0.3V, the amplitude of the picture part is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and is flat, and the ratio of level between the burst signal and the “red” signal is 0.33 : 0.66. The video signal (color bar) used for the adjustment is shown in the fig. 7-2-2.

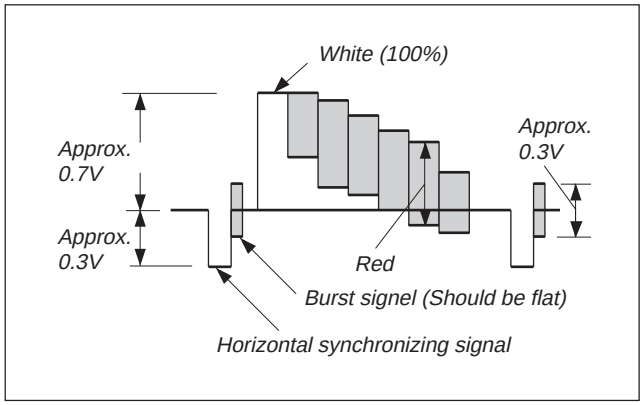


Fig. 7-2-2. Color bar signal of the pattern generator

2-1-4. Alignment Tape

• Contents of MH-2 (Normal-VHS)

	Mode	Period	Video signal	Audio signal
1	SP	10 minutes	Stair step	7kHz
2		5 minutes	———	3kHz
3		10 minutes	Color bar	1kHz
4		3 minutes	RF sweep	———

2-1-5. Specified Input-output Level and the Impedance

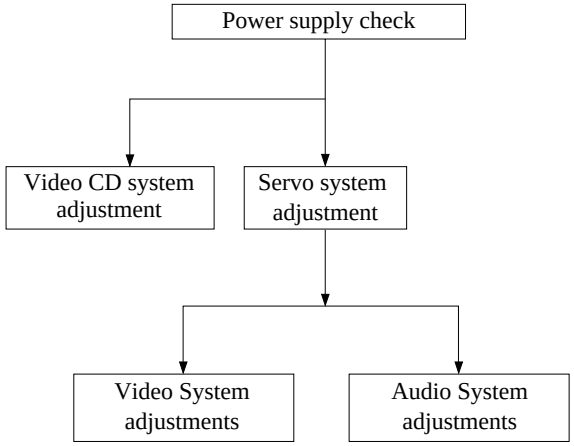
LINE-1/2 IN
VIDEO IN, phono jack (1 each)
Input signal: 1 Vp-p, 75 Ω,
unbalanced, sync negative
AUDIO IN, phono jack (2 each)
Input level: 327 mVrms
Input impedance: more than 47 kΩ

LINE-1/2 OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 Ω,
unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 327 mVrms
Load impedance: 47 kΩ
Output impedance: less than 10 kΩ

Video CD DIRECT OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 Ω,
unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 2.0 Vrms max
Load impedance: 47 kΩ
Output impedance: less than 600 Ω

2-1-6. Adjustment Procedures

Perform the adjustment following the procedures given below.



2-2. VIDEO-CD COLOR-BARS MODE

On this mode, the data of the color-bars signal as a picture signal and the 1 kHz sine wave signal as a sound signal are output by the mechanism control microcomputer (IC301) for video CD signal check. When measurement of the voltage and waveform on the CD-169 board, perform it in this mode.
For reference, the color-bars signal can be observed at Video CD DIRECT OUT (VIDEO) terminal and the sound signal can be observed at Video CD DIRECT OUT (AUDIO) terminal using an oscilloscope.

[Setting Method]

1) Turn the power on.
2) Connect the SOL303 on the CD-169 board with solder.
3) After measuring, remove the soldering installed.

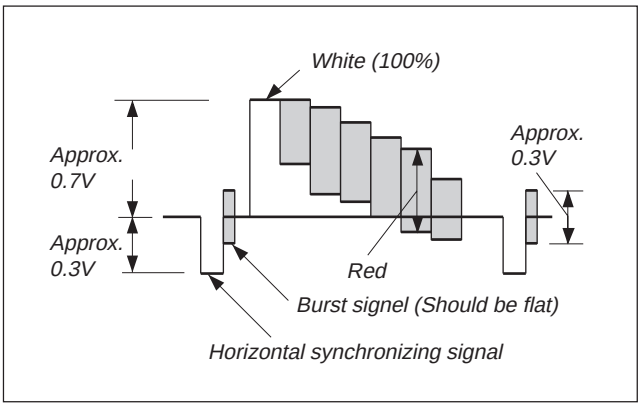


Fig. 7-2-3. Color bar signal of the Color-bars mode

2-3. POWER SUPPLY CHECK

2-3-1. Output Voltage Check (PS-418 Board)

Mode	E-E
Measuring instrument	Digital voltmeter
SW 5V check	
Measurement point	CN101 pin①
Specified value	5.3 ± 0.3 Vdc
D 6V check	
Measurement point	CN101 pin⑤, CN103 pin⑦
Specified value	5.9 ± 0.3 Vdc
+ F check	
Measurement point	CN101 between pin⑥ to ⑧
Specified value	4.6 ± 0.7 Vdc
DC –30V check	
Measurement point	CN101 pin⑦
Specified value	– 30 ± 3.0 Vdc
PS 13V check	
Measurement point	CN102 pin①, ②
Specified value	13.2 ± 1.0 Vdc
MTR 12V check	
Measurement point	CN102 pin③, ④
Specified value	12 ± 1.0 Vdc
SW 12V check	
Measurement point	CN102 pin⑧, CN103 pin①
Specified value	12 ± 0.5 Vdc
AU –13V check	
Measurement point	CN102 pin⑨
Specified value	– 13 ± 0.5 Vdc
SW –13V check	
Measurement point	CN103 pin④
Specified value	– 13 ± 0.5 Vdc
MTR 10V check	
Measurement point	CN103 pin⑨
Specified value	10 ± 1.0 Vdc

[Check Method]

1) Check that each voltage satisfied the specified value.

Note : AC input voltage = 240 ± 5 Vac

2-4. VIDEO-CD SYSTEM ADJUSTMENTS

- CD Block is basically to operate without adjustment. Therefore, check each item in order given.
- Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
- Use an oscilloscope with more than 10MΩ impedance.
- Clean the object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

[Adjustment Sequence]

1) S-Curve check
2) RF level check
3) E-F Balance (Traverse) check
4) RF PLL Free-run Frequency check
5) Clock Adjustment

2-4-1. S-Curve Check (BD-21 Board)

Signal	Reference disc
Measurement point	+ : TP FE – : TP VC
Measuring instrument	Oscilloscope
Specified value	S-curve is symmetrical between A and B.

[Check Method]

1) Connect oscilloscope to test point TP (FE) on BD-21 board.
2) Connect between test point TP (FEI) and TP (VC) by lead wire.
3) Turned Power switch on.
4) Put disc (YEDS-18) in and turned Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5) Check the oscilloscope waveform (S-curve) is symmetrical between A and B.
   And confirm peak to peak level within 3 ± 1 Vp-p.
6) After check, remove the lead wire connected in step 2.

S-curve waveform

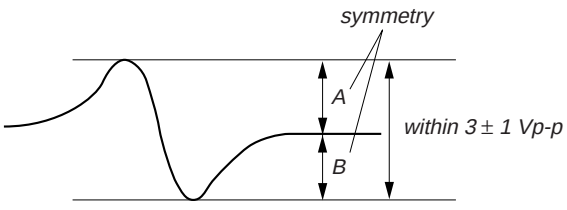


Fig. 7-2-6.

Note : • Try to measure several times to make sure than the ratio of A : B or B : A is more than 10 : 7.
• Take sweep time as long as possible and light up the brightness to obtain best waveform.

2-4-2. RF Level Check (BD-21 Board)

Signal	Reference disc
Measurement point	+ : TP RF – : TP VC
Measuring instrument	Oscilloscope
Specified value	Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

[Check Method]

1) Connect oscilloscope to test point TP (RF) on BD-21 board.
2) Turned Power switch on.
3) Put disc (YEDS-18) in to play the number five track.
4) Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

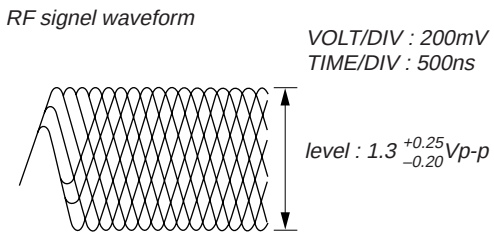


Fig. 7-2-7.

Note : A clear RF signal waveform means that the shape "◇" can be clearly distinguished at the center of the waveform.

2-4-3. E-F Balance (Traverse) Check (BD-21 Board)

Signal	Reference disc
Measurement point	+ : TP TE – : TP VC
Measuring instrument	Oscilloscope
Specified value	$\frac{A}{B} \times 100$=less than ± 20%

[Check Method]

1) Connect oscilloscope to test point (TE) on BD-21 board.
2) Turned Power switch on.
3) Connect the SOL301 and SOL302 on the CD-169 board with solder.
4) Put disc (YEDS-18) in to play the number five track.
5) Press the PLAY button in playback.
6) Press the RETURN button. (The tracking servo and the sledding servo are turned OFF.)
7) Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform.
   Confirm the following :
   A/B × 100=less than ± 22%

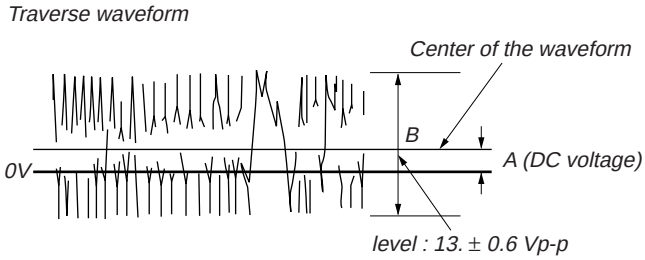


Fig. 7-2-8.

8) Press the RETURN button. (The tracking servo and sledding servo are turned ON.) Confirm the C (DC voltage) is almost equal to the A (DC voltage) is step 6.
9) Remove the soldering installed in step 3.

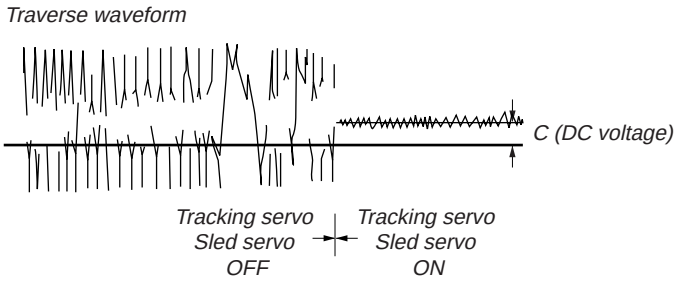


Fig. 7-2-9.

2-4-4. RF PLL Free-run Frequency Check (BD-21 Board)

Signal	Reference disc
Measurement point	TP PLCK
Measuring instrument	Frequency counter
Specified value	4.3218 MHz

[Check Method]

1) Connect frequency counter to TP (PLCK) with lead wire.
2) Turned Power switch on.
3) Put the disc (YEDS-18) in to play the number five track. Confirm that reading on frequency counter is 4.3218 MHz.

2-4-5. Clock Adjustment (CD-169 Board)

Measurement point	IC305 pin ⑧⑨
Measuring instrument	Frequency counter
Adjustment element	CT301
Specified value	13500000 ± 40 Hz

[Adjusting Method]

1) Connect the frequency counter to check point of the CD-169 board.
2) Adjust CT501 of the CD-169 board so that the frequency counter read 13.5 MHz ± 40 Hz at STOP condition.

2-5. SERVO SYSTEM ADJUSTMENT

2-5-1. RF Switching Position Adjustment (MA-303 Board)

[Adjustment Object]

To adjust the link of the Ach and Bch of the tape playback outputs. If this specification is not satisfied, the noise will increase and cracking sounds will be produced.

Mode	Playback
Signal	Alignment tape : Color bar portion
Measurement point	CH1 : LINE-1 OUT VIDEO terminal CH2 : CN502 pin③ (RF SWP)(RP-233 board)
Measuring instrument	Oscilloscope
Adjustment element	RV202
Specified value	6.5 ± 0.5H (416 ± 32 μsec)

[Adjusting Method]

1) Set TRACKING switch (Remote commander) to MANUAL. ("Auto tracking" display will disappear on the display window indicator.)
2) Press the tracking buttons ▼ and ▲ and adjust the tracking position to the center.
3) Adjust to 6.5 ± 0.5H (413 ± 32μsec) using RV202.

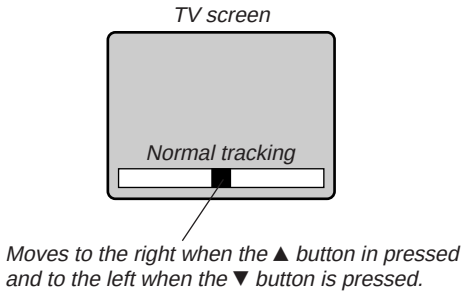


Fig. 7-2-10.

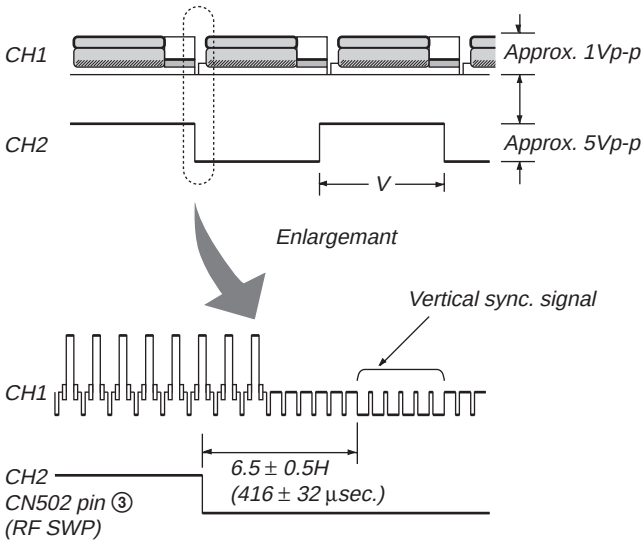


Fig. 7-2-11.

2-6. VIDEO SYSTEM ADJUSTMENTS

For the video system adjustment, follow the adjustment procedures given below as a rule. The color bar video signal supplied from the pattern generator is used as the video input signal for the video system adjustment of the recording mode. Check that the signal satisfies the specified value designated in the "Check of input signal (Fig. 7-2-2)".

[Adjustment Sequence]

1) X'tal OSC Check
2) SYNC AGC Check
3) White Clip/Dark Clip Check
4) REC Y Level Check
5) REC Chroma Level Check
6) Playback Level Check

2-6-1. X'tal OSC Check (MA-303 Board)

Mode	Playback
Signal	Alignment tape : Color bar portion
Measurement point	IC304 pin⑧
Measuring instrument	Oscilloscope and Frequencycounter
Specified value	PAL : 4,433,619 ± 82 Hz NTSC : 3,579,545 ± 82 Hz

Note : A frequency counter should be connected through a buffer ampifier (oscilloscope, etc.) having a high impedance and a low capacitance.

[Check Method]

1) Check that the oscillation frequency satisfies the specified value and that the oscillation voltage A is 300 ± 130 mVp-p (PAL)/ 250 ± 110 mVp-p (NTSC).

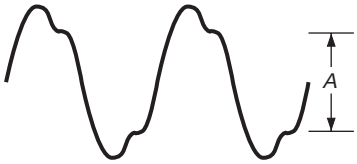


Fig. 7-2-12.

2-6-2. SYNC AGC Check (MA-303 Board)

Mode	E-E
Signal	Color bar
Measurement point	LINE-1 OUT VIDEO terminal (terminated at 75 Ω)
Measuring instrument	Oscilloscope
Specified value	A=1.0 ± 0.14 Vp-p

[Check Method]

1) Check that the SYNC AGC level (A) satisfies the specified value.

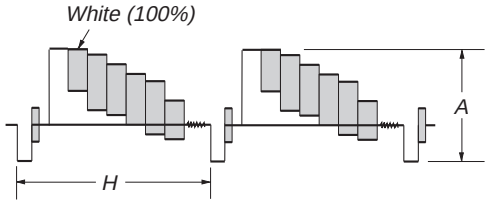


Fig. 7-2-13.

2-6-3. White Clip/Dark Clip Check (MA-303 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC302 pin㊽
Measuring instrument	Oscilloscope
Specified value	White clip : A=190 ± 15% Dark clip : B=52 ± 10%

[Check Method]

1) Check that the white clip level A is 190±15% to the white (100%) level.
2) Check that the dark clip level B is 52±10% to the white (100%) level.

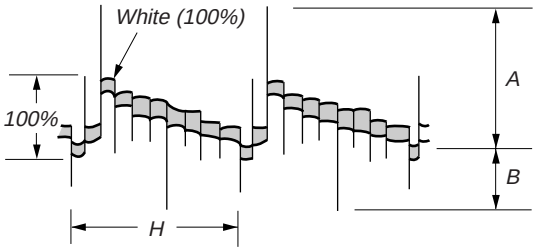


Fig. 7-2-14.

2-6-4. REC Y Level Check (MA-303 Board)

Mode	E-E
Signal	No signal
Measurement point	Q301Ⓔ or CN301 pin⑥
Measuring instrument	Oscilloscope
Specified value	A=400 ± 120 mVp-p

[Check Method]

1) Check that the record Y level A satisfies the specified value.

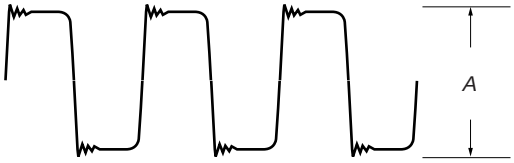


Fig. 7-2-15.

2-6-5. REC Chroma Level Check (MA-303 Board)

Mode	E-E
Signal	Color bar
Measurement point	Q314Ⓔ
Measuring instrument	Oscilloscope
Specified value	A=140 ± 20 mVp-p (PAL SP) A=160 ± 20 mVp-p (PAL LP) A=160 ± 20 mVp-p (NTSC SP) A=200 ± 20 mVp-p (NTSC LP)

[Adjusting Method]

1) Check that the record chroma level A satisfies the specified value.

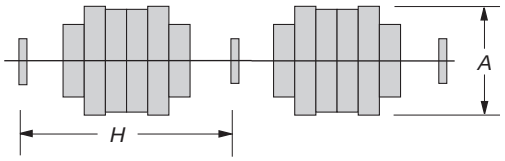


Fig. 7-2-16.

2-6-6. Playback Level Check (MA-303 Board)

Mode	Playback
Signal	Alignment tape : Color bar portion
Measurement point	LINE-1 OUT VIDEO terminal (terminated at 75Ω)
Measuring instrument	Oscilloscope
Specified value	A=1.0 ± 0.18 Vp-p

[Check Method]

1) Check that the playback level satisfies the specified value.

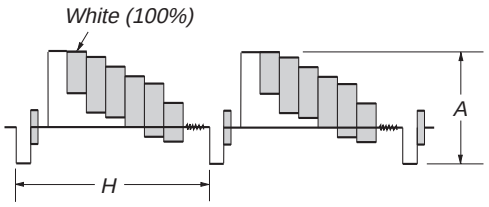


Fig. 7-2-17.

2-6-7. VCO Frequency Adjustment (MA-303 Board)

[Adjustment Object]

Adjust to set the character position on the screen.

Mode	E-E
Signal	Color bar
Measurement point	IC401 pin㉖
Measuring instrument	Oscilloscope (DC mode)
Adjustment element	CT401
Specified value	A=2.80 ± 0.05 Vdc

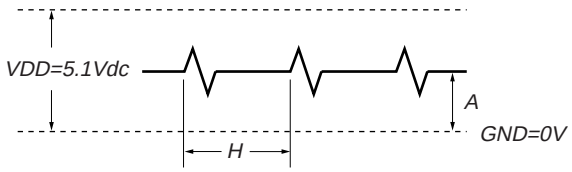


Fig. 7-2-18.

2-7. AUDIO SYSTEM ADJUSTMENTS

- For the adjustment of the audio system, perform in the SP mode if there is no special notes. Use the alignment tape.
- Adjust both LCH and RCH.

[Connecting Instruments]

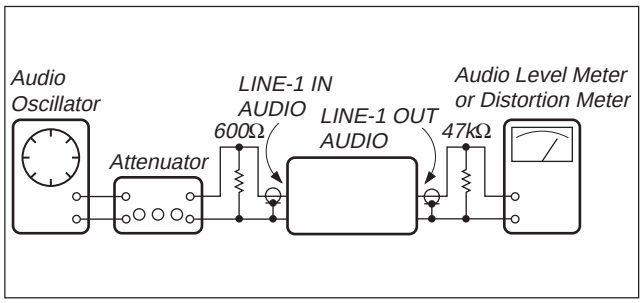


Fig. 7-2-19.

● Hi-Fi Audio System Adjustment

Perform the adjustment setting the switches and controls on the following positions if there is no special indications.

- INPUT SELECT (VHS) switch 1
- AUDIO MONITOR switch * ..... Stereo

∗ : Remote commander

2-7-1. AF Switching Position Adjustment (MA-303 Board)

[Adjustment Object]

To adjust the link of the Ach and Bch of the tape playback outputs. If this specification is not satisfied, the noise will increase and cracking sounds will be produced.

Mode	Playback
Signal	Alignment tape
Measurement point	CH1 : AF SWP (ADJ LAND)(RP-233 board) CH2 : CN502 pin③(RP SWP)(RP-233 board)
Measuring instrument	Oscilloscope
Adjustment element	RV201
Specified value	No dropouts in the RF signal

[Adjusting Method]

1) Set TRACKING switch (Remote commander) to MANUAL. ("Auto tracking" display will disappear on the display window indicator.)
2) Press the tracking buttons ▼ and ▲ and adjust the tracking position to the center.
3) Use RV201 to adjust so that the portion A is minimized.

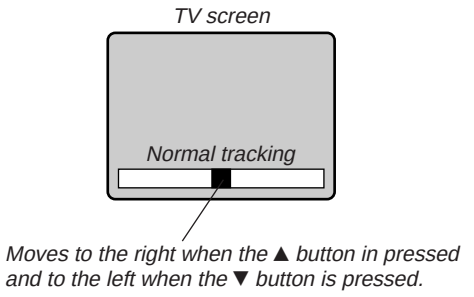


Fig. 7-2-20.

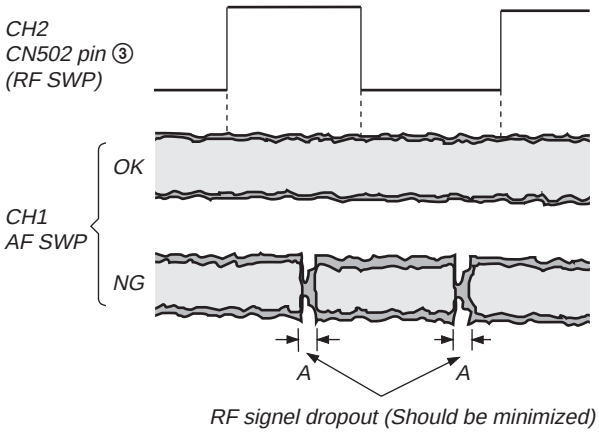


Fig. 7-2-21.

Note : The RF SWP adjustment should be completed before performing this adjustment.

2-7-2. VCO f_0 Adjustment (MA-303 Board)

[Adjustment Object]

To attain Hi-Fi audio compatibility.
If this apecification is not satisfied, the sound will be distorted.

Mode	Recording	
Signal	No-signal	
Measuring instrument	Frequency counter	
Measurement point	CN501 pin① or AF SWP (RP-233 board)	
1.3 MHz adjustment		Auto tracking ON (Remote commander)
Adjustment element	RV521 (Lch)	
Specified value	1300 $^{+1}_{-0}$ kHz	
1.4 MHz adjustment		
Adjustment element	RV522 (Lch)	
Specified value	1400 ± 1kHz	
1.7 MHz adjustment		Auto tracking OFF (Remote commander)
Adjustment element	RV531 (Rch)	
Specified value	1700 $^{+1}_{-0}$ kHz	
1.8 MHz adjustment		
Adjustment element	RV532 (Rch)	
Specified value	1800 ± 1kHz	

Note : Connect the frequency counter through the buffer amplifier (oscilloscope, etc) with high input resistance (1MΩ or more) and low capacity (10pF or less).

[Adjusting Method]

1) Connect pin② of CN891 to the ground.
2) Set TRACKING button on the remote commander to AUTO.
3) Adjust RV521 so as to obtain 1300 $^{+1}_{-0}$ kHz.
4) Adjust RV522 so as to obtain 1400 ± 1 kHz.
5) Set TRACKING button on the remote commander to MANUAL.
6) Adjust RV531 so as to obtain 1700 $^{+1}_{-0}$ kHz.
7) Adjust RV532 so as to obtain 1800 ± 1 kHz.

2-7-3. Deviation Check (MA-303 Board)

Mode	Recording
Signal	400 Hz, –7.5 dBs : CN801 pin⑥⑧
Measurement point	CN501 pin① or AF SWP (RP-233 board)
Measuring instrument	Modulation Analyzer
Specified value	50 ± 50kHz

[Check Method]

1) Connect pin② of CN891 to the ground.
2) Set TRACKING button on the remote commander to AUTO.
3) Verify that the output signal satisfies the specification.
4) Set TRACKING button on the remote commander to MANUAL.
5) Verify that the output signal satisfies the specification.

2-7-4. Band Pass Filter f0 Adjustment (MA-303 Board)

[Adjustment Object]

To separate the carrier accurately and ensure that the filter for cutting the video signal functions normally.
If this specification is not satisfied, the sound will be distored.

Mode	Playback
Signal	1,608MHz, 200mVp-p : CN501 pin③
Measurement point	CN501 pin①
Measuring instrument	Oscilloscope
Adjustment element	RV541
Specified value	Adjust the A and B amplitudes to the same level. (A–B=±2mVp-p)

[Adjusting Method]

1) Connect pin② of CN891 to the ground.
2) Set TRACKING button on the remote commander to AUTO. (Lch signal output)
3) Assume the output value at this time as A.
4) Set TRACKING button on the remote commander to MANUAL. (Rch signal output)
5) Assume the output value at this time as B. Adjust RV541 so that A is equal to B.

● Normal Audio System Adjustment

- Adjust in the SP mode if there is no special indications.
- Perform the adjustment setting the switch on the following positions.
- INPUT SELECT (VHS) switch 1
- AUDIO MONITOR switch * NORMAL*1

*1 : No indicates on the display window indicator and monitor TV.

[Adjustment Sequence]

1) ACE head adjustment .... Refer to the VHS mechanical part adjustment manual Ⅳ
2) Recording bias check
3) E-E output level check
4) Overall output level and distortion factor check.
5) Overall noise level check.

2-7-5. ACE Head Adjustment

Refer to the "VHS Mechanical adjustment manual Ⅳ" (9-973-623-11).

2-7-6. Recording Bias Check (MA-303 Board)

Mode	Self-record playback
Signal	400Hz, – 27.5dBs ┐ LINE-1 IN AUDIO 7kHz, – 27.5dBs ┘ terminal (L or R)
Measurement point	LINE-1 OUT AUDIO terminal
Measuring instrument	Audio level meter
Specified value	0 ± 3dBs

[Adjusting Method]

1) Supply a signal of 400Hz, –27.5dBs to Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –27.5dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400Hz and 7kHz.
7) Confirm that the 7kHz playback output levels within a range of the 400Hz playback output level 0±3dB.

2-7-7. E-E Output Level Check

Mode	E-E
Signal	400Hz, – 7.5dBs : LINE-1 IN AUDIO terminal
Measurement point	LINE-1 OUT AUDIO terminal
Measuring instrument	Audio level meter
Specified value	– 7.5 ± 2dBs

[Check Method]

1) Input signal of 400Hz and –7.5 dBs to the L and R channel of the audio input at the same time.
2) Check that the audio output level is –7.5 ± 2dBs.

2-7-8. Overall Output Level and Distortion Factor Check

Mode	Self-record playback
Signal	400Hz, –7.5dBs : LINE-1 IN AUDIO terminals, left and right
Measurement point	LINE-1 OUT AUDIO terminal
Measuring instrument	Audio level meter and Distortion meter
Specified value	Playback Level : –7.5 ± 3dBs Distortion : 4.0% or less

[Check Method]

1) Record signal.
2) Playback the recorded portion.
3) Check that the output level is –7.5 ± 3dBs.
4) Check that the distortion factor is 4.0% or less on the left and right side.

2-7-9. Overall Noise Level Check

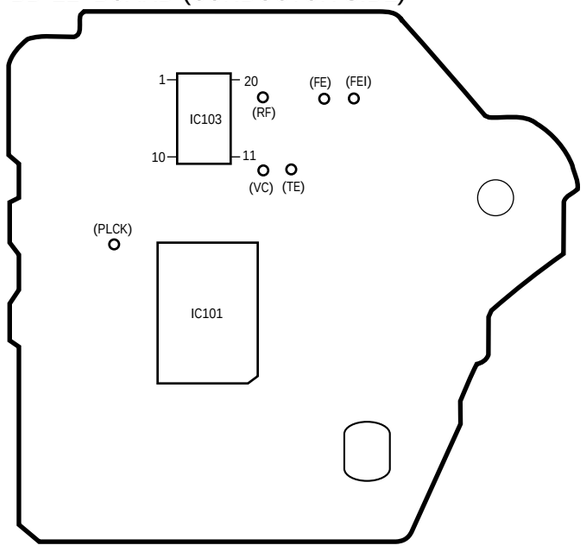
Mode	Self-record playback
Signal	No signal (Insert a shorting plug into the LINE-1 OUT AUDIO jacks, left and right.)
Measurement point	LINE-1 OUT AUDIO terminal
Measuring instrument	Audio level meter
Specified value	–46dBs or less

[Check Method]

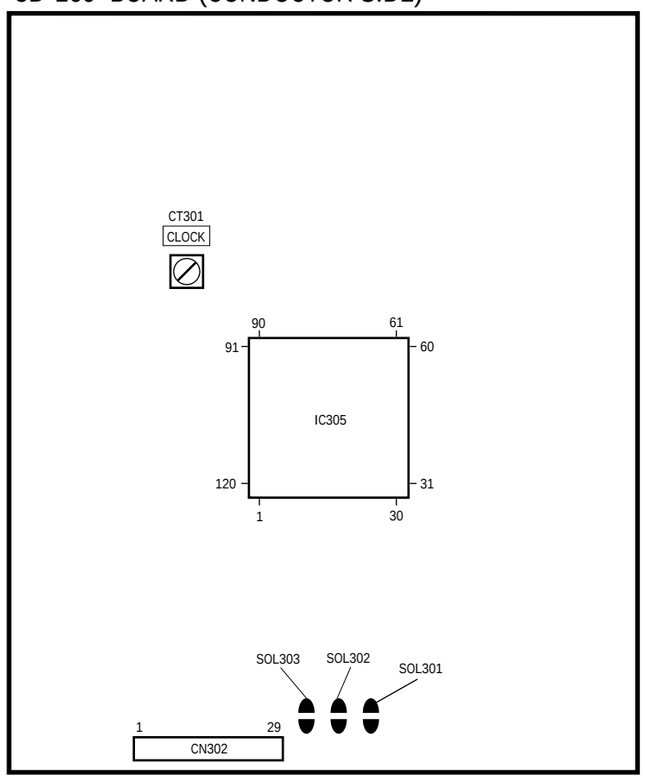
1) Record.
2) Playback recorded portion.
3) Check that noise level is –46dBs or less on the left and right side.

2-8. ADJUSTMENT PARTS LOCATION DIAGRAMS

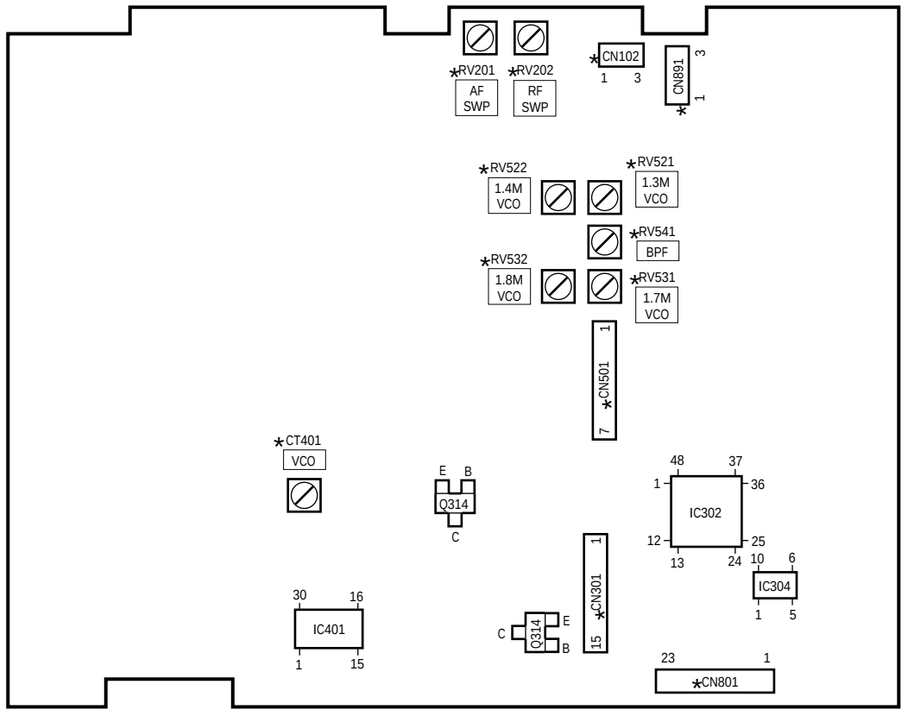
BD-21 BOARD (CONDUCTOR SIDE)



CD-169 BOARD (CONDUCTOR SIDE)

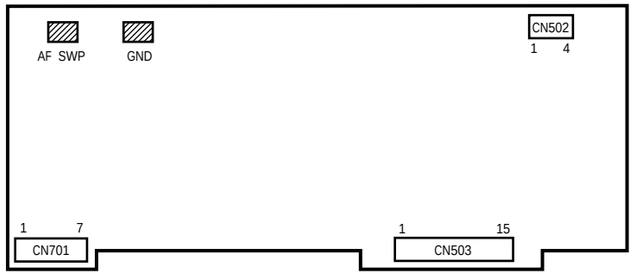


MA-303 BOARD (CONDUCTOR SIDE)



*: Part on the component side.

RP-233 BOARD (CONDUCTOR SIDE)



SECTION 8
REPAIR PARTS LIST

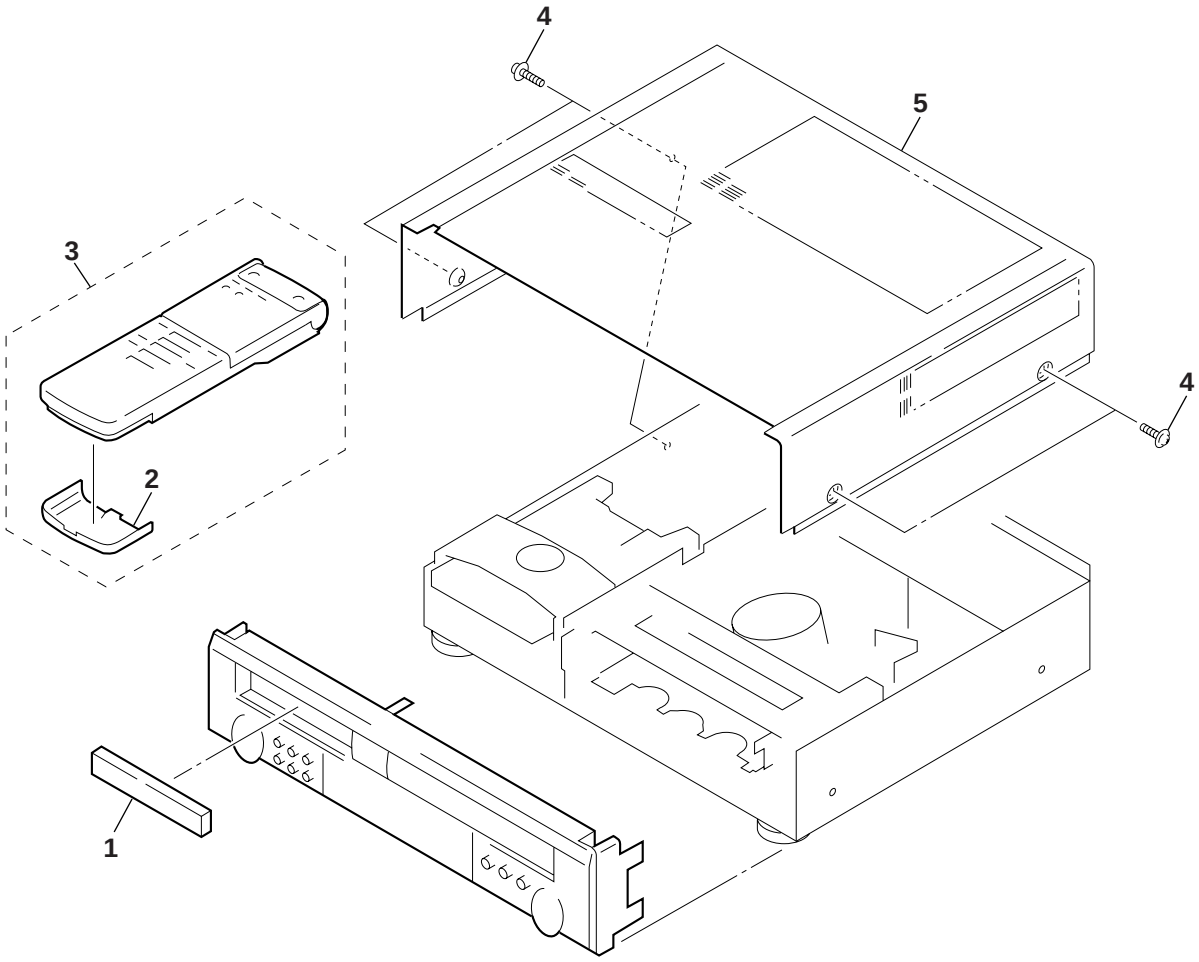
8-1. EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

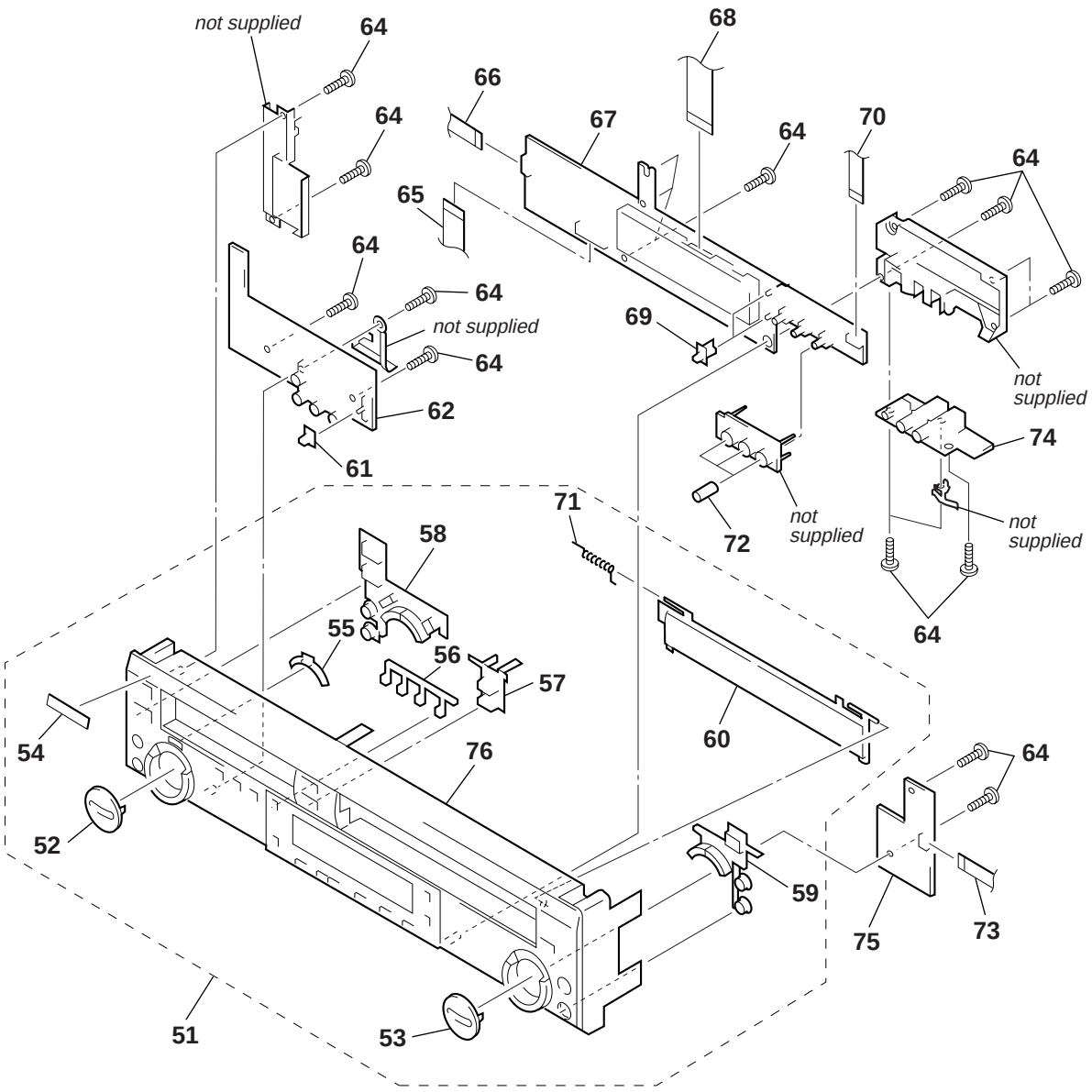
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

8-1-1. CASE ASSEMBLY



Ref. No.	Part No.	Description	Remarks
1	3-975-248-11	PANEL, LOADING	
2	3-709-299-01	COVER, BATTERY (V208)	
3	1-475-097-11	COMMANDER, STANDARD (RMT-V208)	
4	3-710-901-41	SCREW, TAPPING	
5	3-975-277-11	CASE, UPPER	

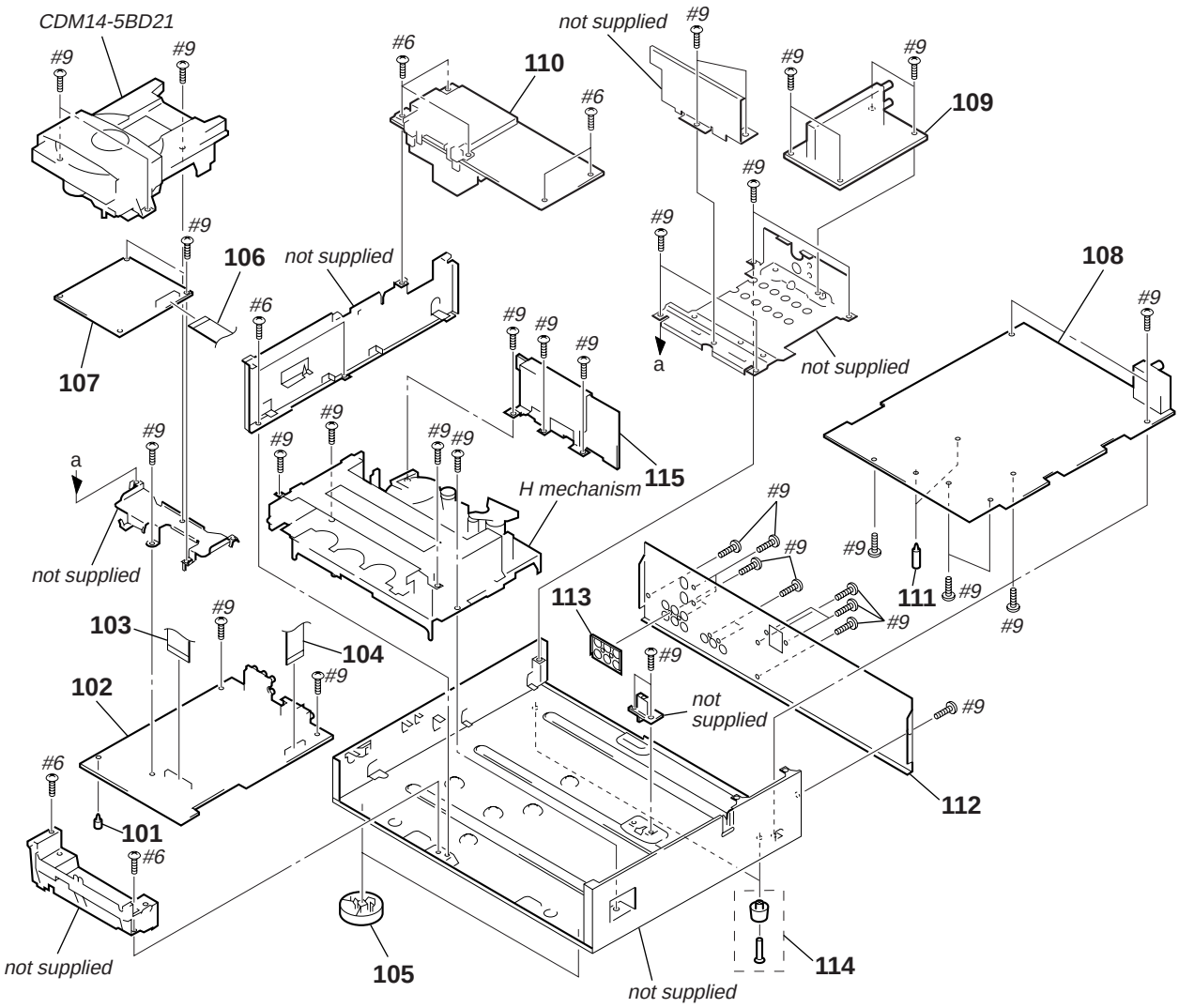
8-1-2. FRONT PANEL ASSEMBLY



Ref. No.	Part No.	Description	Remark
51	X-3949-006-1	PANEL ASSY, FRONT	
52	3-975-251-41	BUTTON, CENTER	
53	3-975-251-51	BUTTON, CENTER	
54	3-943-995-01	EMBLEM (NO.5), SONY	
* 55	3-975-258-01	INDICATOR, MENU	
56	3-975-253-11	BUTTON, INCELL	
* 57	3-975-250-02	INDICATOR, CD	
58	3-975-246-21	BUTTON (CD), SUB CONTROL	
59	3-975-254-21	BUTTON (V), SUB CONTROL	
60	3-975-252-21	DOOR, CASSETTE	
61	3-975-262-11	KNOB (A), SLIDE	
62	A-6794-575-A	IO-65 BOARD, COMPLETE	
64	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	

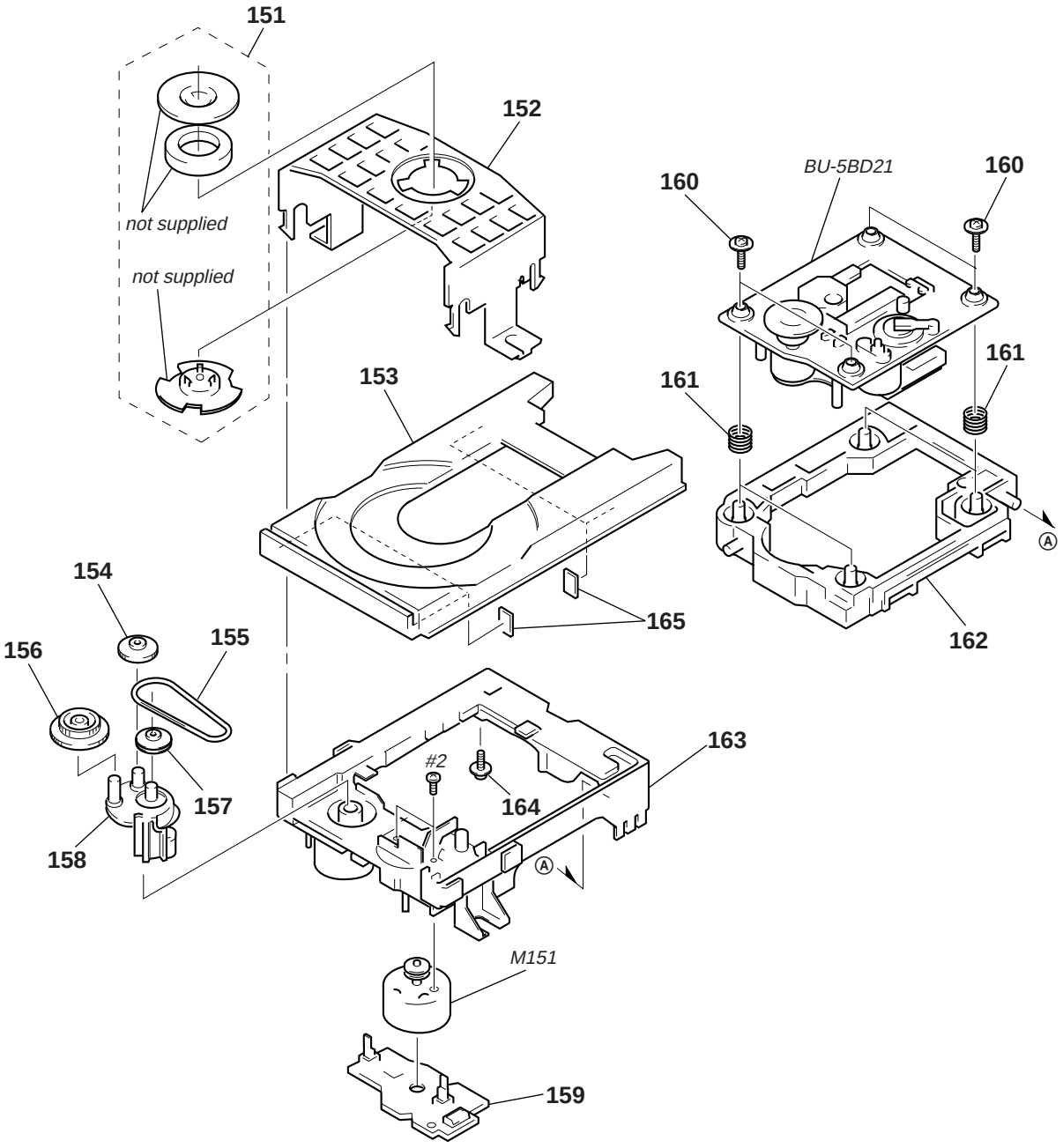
Ref. No.	Part No.	Description	Remark
65	1-782-142-11	CABLE, FLAT (FHC-1) 21P	
66	1-782-140-11	CABLE, FLAT (FHO-1) 11P	
* 67	A-6794-576-A	HI-66 BOARD, COMPLETE	
68	1-782-141-11	CABLE, FLAT (FHA-1) 19P	
69	3-975-263-11	KNOB (B), SLIDE	
70	1-782-139-11	CABLE, FLAT (FHJ-1) 9P	
71	3-951-089-11	SPRING (GE), FL	
72	3-964-584-61	KNOB, VOL	
73	1-782-146-12	CABLE, FLAT (FHS-1) 7P	
* 74	A-6794-578-A	MJ-92 BOARD, COMPLETE	
* 75	A-6794-577-A	SW-323 BOARD, COMPLETE	
76	3-975-245-21	PANEL, FRONT	

8-1-3. CHASSIS ASSEMBLY



Ref. No.	Part No.	Description	Remark
101	3-682-057-11	SPACER (SMALL)	
* 102	A-6794-350-A	MB-77 BOARD, COMPLETE	
103	1-782-144-11	CABLE, FLAT (FCB-1) 29P	
104	1-782-145-11	CABLE, FLAT (FAB-1) 23P	
105	X-3945-884-2	INSULATOR ASSY	
106	1-782-143-12	CABLE, FLAT (FCD-3) 29P	
* 107	A-6791-239-A	CD-169 BOARD, COMPLETE	
108	A-6791-683-A	MA-303 BOARD, COMPLETE	
* 109	A-6794-574-A	TU-168 BOARD, COMPLETE	
* 110	A-6794-579-A	PS-418 BOARD, COMPLETE	
* 111	3-691-950-01	SPACER, P.C.BOARD	
112	3-975-264-41	PANEL, REAR (ML)	
112	3-975-264-51	PANEL, REAR (ME)	
* 113	3-975-275-01	PLATE, JACK GROUND	
* 114	3-957-819-11	FOOT	
* 115	A-6791-684-A	RP-233 BOARD, COMPLETE	

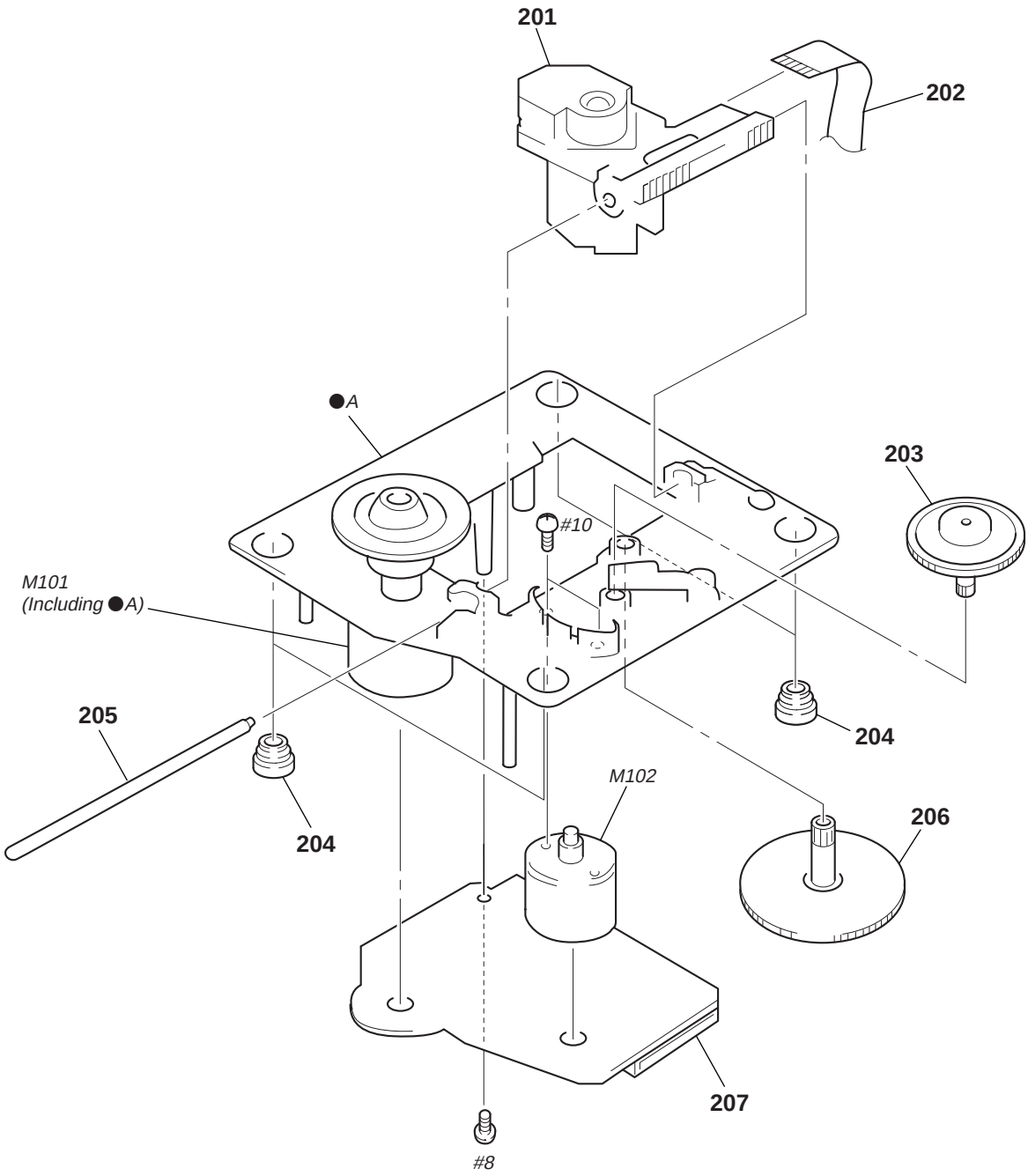
8-1-4. VCD MECHANICAL DECK ASSEMBLY (CDM14-5BD21)



Ref. No.	Part No.	Description	Remark
151	1-452-838-12	MAGNET (ASSY)5	
152	4-933-110-41	HOLDER (MG)	
153	4-933-112-01	TABLE, DISC	
154	4-967-268-01	GEAR (C)	
155	4-927-649-01	BELT	
156	4-933-107-01	GEAR (PL)	
157	4-927-651-01	PULLEY (S)	
158	4-933-109-01	CAM	

Ref. No.	Part No.	Description	Remark
* 159	1-645-721-12	CDM-14 BOARD	
160	4-933-134-01	SCREW (+PTPWH M2.6X6)	
161	4-959-996-01	SPRING (932), COMPRESSION	
162	4-933-129-01	HOLDER (BU)	
163	4-933-111-41	CHASSIS (MD)	
* 164	4-917-583-21	BRACKET, YOKE	
165	4-925-315-31	DAMPER	
M151	A-4699-134-A	MOTOR (L) ASSY (LOADING)	

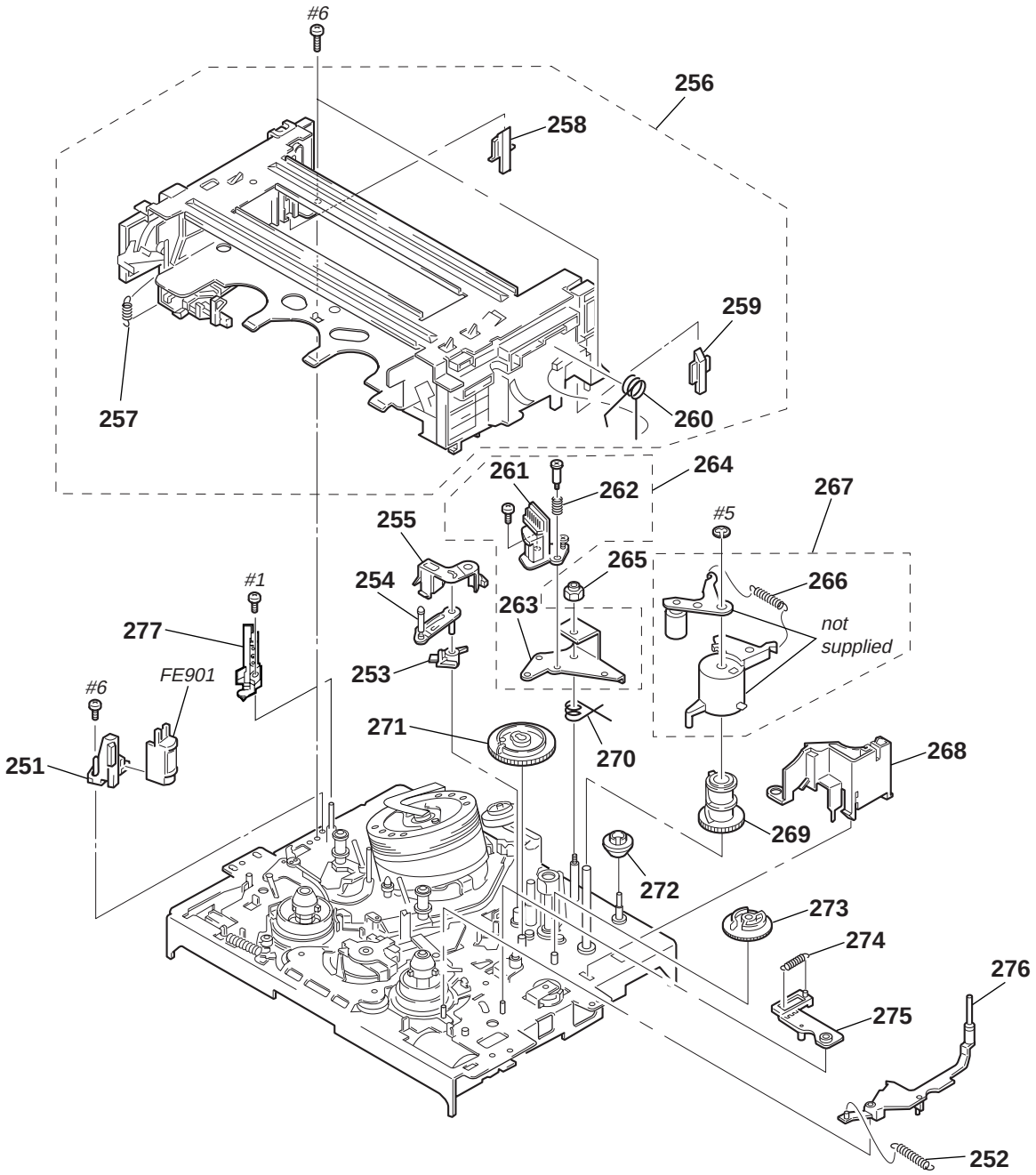
8-1-5. OPTICAL PICK-UP ASSEMBLY (BU-5BD21)



Ref. No.	Part No.	Description	Remark
⚠201	8-848-367-11	OPTICAL PICK-UP BLOCK KSS-213B/K-N	
202	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
203	4-917-567-01	GEAR (M)	
204	4-951-940-01	INSULATOR (BU)	
205	4-917-565-01	SHAFT, SLED	
206	4-917-564-01	GEAR (P), FLATNESS	
* 207	A-4673-557-A	BD-21 BOARD, COMPLETE	
M101	X-4917-523-4	MOTOR ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

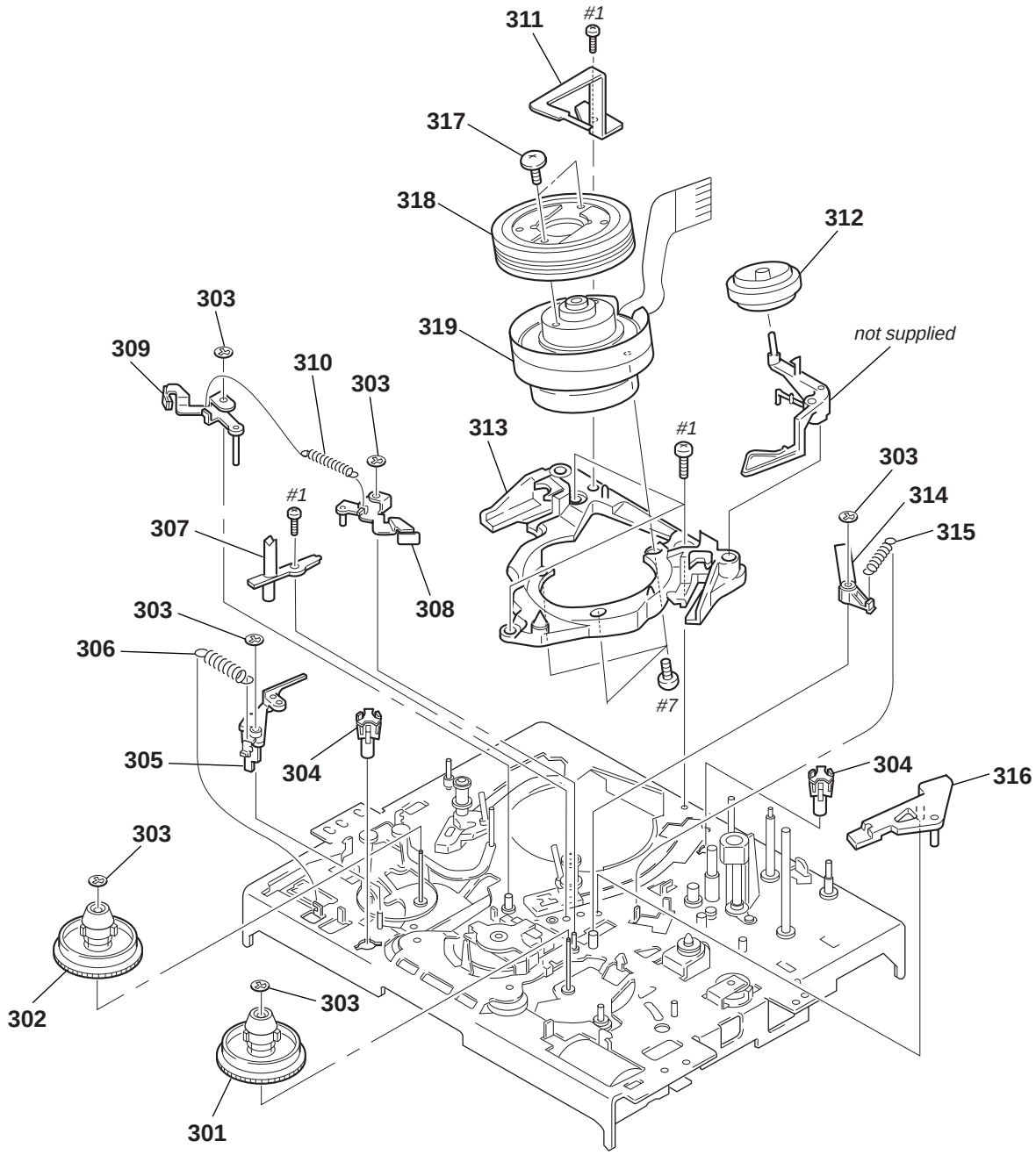
8-1-6. VHS MECHANICAL DECK ASSEMBLY (1)



Ref. No.	Part No.	Description	Remark
251	X-3945-348-2	FEH ASSY	
252	3-958-505-01	SPRING (SOFT BRACKET), TENSION	
253	3-958-421-01	HOLDER, TG8	
254	X-3944-797-1	TG8 ASSY	
255	3-962-298-01	BRACKET, TG7 TAPE	
256	A-6759-603-A	FL BLOCK ASSY	
257	3-958-467-01	SPRING, TENSION COIL	
258	3-960-215-01	PLATE, END SENSOR LIGHT GUIDE	
259	3-970-473-01	PLATE, TOP SENSOR LIGHT GUIDE	
260	3-970-471-01	SPRING (DECK OPEN), TORSION	
261	1-506-485-11	PIN, CONNECTOR 6P	
262	3-960-439-02	SPRING (ACE), COMPRESSION	
263	3-958-491-01	BASE, ACE	
264	A-6736-103-A	ACE BLOCK ASSY	

Ref. No.	Part No.	Description	Remark
265	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
266	3-958-455-01	SPRING (PINCH), TENSION	
267	A-6746-072-A	PRESS BLOCK ASSY, PINCH	
268	3-958-454-01	OPENER, LID	
269	3-958-151-01	GEAR, ELEVATOR	
270	3-958-487-01	SPRING, (ACE) TORSION COIL	
271	3-958-152-01	GEAR, TG8	
272	3-958-501-01	SCREW, ACE ADJUSTMENT	
273	3-958-153-01	GEAR, PRESS	
274	3-958-462-01	SPRING (RVS BRAKE), TENSION	
275	X-3943-885-1	ARM ASSY, RVS BRAKE	
276	X-3943-882-1	BRAKE (T) ASSY, SOFT	
277	X-3946-864-1	TC (N17) ASSY	
FE901	1-500-144-11	HEAD, FE	

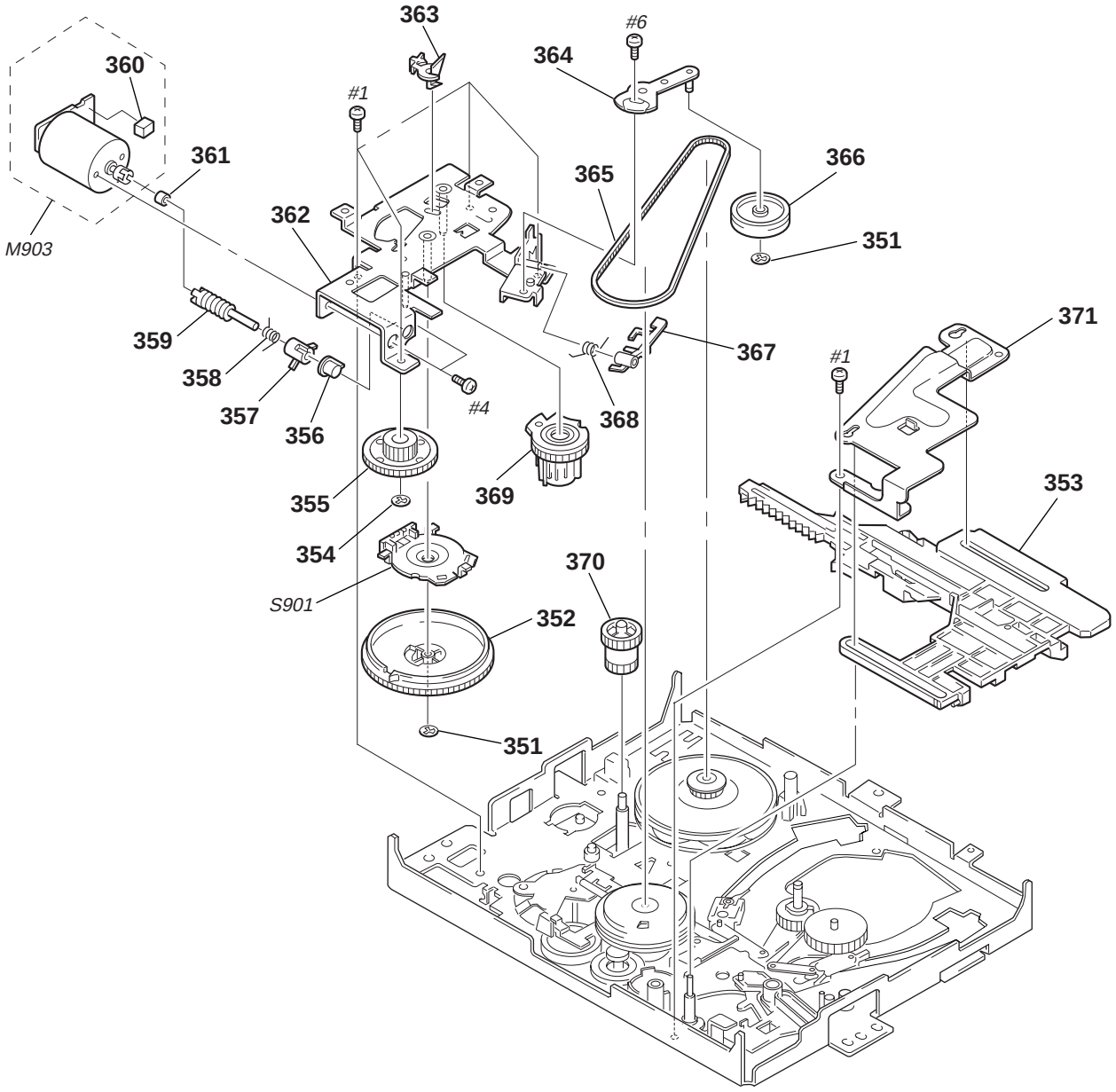
8-1-7. VHS MECHANICAL DECK ASSEMBLY (2)



Ref. No.	Part No.	Description	Remark
301	X-3943-903-1	TABLE, REEL (T) ASSY	
302	X-3943-902-1	TABLE, REEL (S) ASSY	
303	3-669-595-00	WASHER (2), STOPPER	
304	3-958-390-01	SHAFT, PC BOARD	
305	3-958-450-01	BRAKE (S), SOFT	
306	3-958-443-01	SPRING, STRETCH COIL SPRING	
307	3-958-391-01	PLATE, LIGHT GUIDE, LED	
308	X-3945-444-1	BRAKE (T) ASSY, MAIN	
309	X-3945-443-1	BRAKE (S) ASSY, MAIN	
310	3-958-517-01	SPRING, TENSION COIL	

Ref. No.	Part No.	Description	Remark
311	X-3943-899-8	GROUND ASSY, SHAFT	
312	X-3944-363-4	ROLLER ASSY, HC	
313	3-969-629-01	BASE, DRUM	
314	3-960-139-01	ARM, NEUTRALITY	
315	3-958-535-01	SPRING, TENSION	
316	3-960-138-01	ARM, PENDULUM COMPULSION	
317	2-643-205-01	SCREW, +PW 3X8	
318	8-848-625-02	DRUM ASSY, UPPER (DZR-68-R)	
319	8-848-666-11	DRUM ASSY, LOWER (DZL-51B/J-RP)	

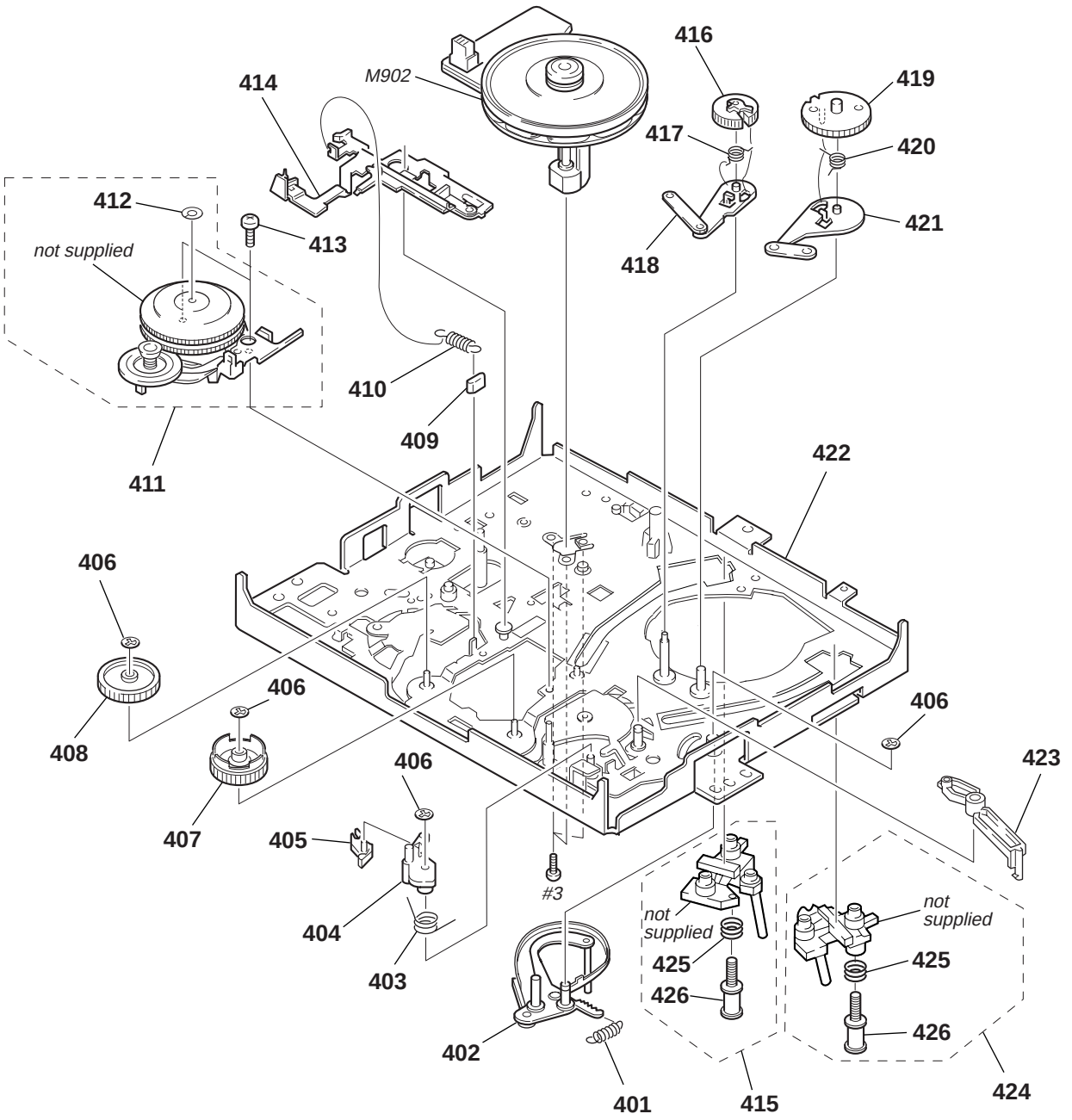
8-1-8. VHS MECHANICAL DECK ASSEMBLY (3)



Ref. No.	Part No.	Description	Remark
351	3-669-595-00	WASHER (2), STOPPER	
352	3-958-161-07	GEAR, CAM	
353	3-958-163-04	SLIDER, MAIN	
354	3-966-092-01	RING, RETAINING, SLIT WASHER	
355	3-958-157-02	WHEEL, WORM	
356	3-958-155-01	BEARING, CAM MOTOR	
357	3-958-160-01	PROPELLOR	
358	3-958-460-01	SPRING, ONE-WAY	
359	3-958-159-01	WORM	
360	1-766-723-11	CONNECTOR, BOARD TO BOARD 3P	
361	3-959-840-11	RUBBER, JOINT	
* 362	X-3943-884-1	CHASSIS ASSY, CAM MOTOR	

Ref. No.	Part No.	Description	Remark
363	3-965-977-03	RETAINER, CAM GEAR	
364	X-3943-889-1	ARM ASSY, TENSION VEHICLE	
365	3-958-361-01	BELT, TIMING	
366	3-958-448-01	WHEEL, TENSION	
367	X-3943-888-1	BRAKE ASSY, CAP	
368	3-958-445-01	SPRING,TORSIONCOIL(CAP BRAKE)	
369	3-958-156-03	GEAR, FL DRIVING	
370	3-958-162-02	GEAR,UPPER/LOWER COMMUNICATION	
* 371	3-959-763-01	RETAINER	
M903	X-3943-883-1	MOTOR ASSY, CAM	
S901	1-762-490-11	SWITCH, ROTARY (ENCODER)	

8-1-9. VHS MECHANICAL DECK ASSEMBLY (4)



Ref. No.	Part No.	Description	Remark
401	3-958-492-01	SPRING (TG1), TENSION COIL	
402	X-3943-886-1	TG1 ASSY	
403	3-958-534-01	SPRING, TORSION	
404	3-958-532-01	ARM, S WINDING	
405	3-958-533-01	CLAW, S WINDING	
406	3-669-595-00	WASHER (2), STOPPER	
407	3-962-959-01	GEAR (S-K), IDLER	
408	3-962-960-01	GEAR (T-K), IDLER	
409	3-959-840-11	RUBBER, JOINT	
410	3-958-529-01	SPRING (MOMENT), TENSION	
411	A-6739-102-A	RKB BLOCK ASSY	
412	3-966-092-01	RING, RETAINING, SLIT WASHER	
413	3-961-441-01	SCREW (3X8)	
414	X-3943-897-1	LEVER ASSY, TRIGGER	

Ref. No.	Part No.	Description	Remark
415	A-6750-325-A	SHUTTLE (T) BLOCK ASSY	
416	3-958-485-02	GEAR (T), LOADING	
417	3-960-449-01	SPRING (T), TORSION COIL	
418	X-3943-891-3	LEVER (T) ASSY, LOADING	
419	3-958-476-01	GEAR (S), LOADING	
420	3-960-448-01	SPRING (S), TORSION COIL	
421	X-3943-890-2	LEVER (S) ASSY, LOADING	
422	X-3945-485-4	CHASSIS ASSY, MECHANICAL	
423	3-958-504-01	ARM, FIXED RELEASE	
424	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
425	3-965-178-01	SPRING	
426	X-3944-378-1	ROLLER ASSY, GUIDE	
M902	1-698-409-14	MOTOR, DC (CAPSTAN)	

BD

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
*	A-4673-557-A	BD BOARD, COMPLETE			
		**********			
					(Ref.No.3,000 series)
		< CAPACITOR >			
C101	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C105	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C106	1-164-346-11	CERAMIC CHIP	1uF		16V
C107	1-164-346-11	CERAMIC CHIP	1uF		16V
C108	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C109	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C110	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C111	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C112	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C113	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C115	1-126-607-11	ELECT CHIP	47uF	20%	4V
C116	1-126-607-11	ELECT CHIP	47uF	20%	4V
C117	1-126-209-11	ELECT CHIP	100uF	20%	4V
C118	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C119	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C123	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C124	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C125	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C140	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C151	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C153	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C154	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C156	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C157	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C159	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C161	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN101	1-774-115-11	CONNECTOR, (FFC/FPC) 29P			
CN102	1-770-014-11	CONNECTOR, FFC/FPC 16P			
		< IC >			
IC101	8-752-369-78	IC CXD2545Q			
IC102	8-759-455-91	IC BA6392FP-E2			
IC103	8-752-072-45	IC CXA1821M-T6			

Ref. No.	Part No.	Description			Remarks
		< TRANSISTOR >			
Q101	8-729-010-08	TRANSISTOR MSB710-R			
		< RESISTOR >			
R101	1-216-077-00	METAL CHIP	15K	5%	1/10W
R102	1-216-097-91	RES,CHIP	100K	5%	1/10W
R103	1-216-077-00	METAL CHIP	15K	5%	1/10W
R104	1-216-085-00	METAL CHIP	33K	5%	1/10W
R105	1-216-097-91	RES,CHIP	100K	5%	1/10W
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R107	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W
R109	1-216-121-91	RES,CHIP	1M	5%	1/10W
R110	1-216-025-91	RES,CHIP	100	5%	1/10W
R112	1-216-049-91	RES,CHIP	1K	5%	1/10W
R123	1-216-073-00	METAL CHIP	10K	5%	1/10W
R124	1-216-097-91	RES,CHIP	100K	5%	1/10W
R125	1-216-033-00	METAL CHIP	220	5%	1/10W
R126	1-216-033-00	METAL CHIP	220	5%	1/10W
R127	1-216-033-00	METAL CHIP	220	5%	1/10W
R131	1-216-037-00	METAL CHIP	330	5%	1/10W
R132	1-216-073-00	METAL CHIP	10K	5%	1/10W
R134	1-216-049-91	RES,CHIP	1K	5%	1/10W
R135	1-216-295-91	SHORT	0		
R136	1-216-295-91	SHORT	0		
R137	1-216-295-91	SHORT	0		
R138	1-216-295-91	SHORT	0		
R141	1-216-089-91	RES,CHIP	47K	5%	1/10W
R142	1-216-081-00	METAL CHIP	22K	5%	1/10W
R143	1-216-103-00	METAL CHIP	180K	5%	1/10W
R144	1-216-103-00	METAL CHIP	180K	5%	1/10W
R146	1-216-073-00	METAL CHIP	10K	5%	1/10W
R147	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R148	1-216-001-00	METAL CHIP	10	5%	1/10W
R149	1-216-003-11	RES,CHIP	12	5%	1/10W
R158	1-216-109-00	METAL CHIP	330K	5%	1/10W
R159	1-216-101-00	METAL CHIP	150K	5%	1/10W
R160	1-216-295-91	SHORT	0		
R161	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R162	1-216-101-00	METAL CHIP	150K	5%	1/10W
		< SWITCH >			
S101	1-572-085-11	SWITCH, LEAF (LIMIT)			

Ref. No.	Part No.	Description			Remarks
*	A-6791-239-A	CD-169 BOARD, COMPLETE			
		**********			
					(Ref.No.3,000 series)
		< CAPACITOR >			
C301	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C302	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C303	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C304	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C305	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C306	1-163-091-00	CERAMIC CHIP	8PF		50V
C307	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C308	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C309	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C310	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C311	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C312	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C313	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C314	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C315	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C316	1-124-779-00	ELECT CHIP	10uF	20%	16V
C317	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C318	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C319	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C320	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C321	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C322	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C323	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C324	1-126-204-11	ELECT CHIP	47uF	20%	16V
C325	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C326	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C327	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C328	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C329	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C330	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C331	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C332	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C333	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C334	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C335	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C336	1-126-193-11	ELECT	1uF	20%	50V
C337	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C338	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C339	1-124-779-00	ELECT CHIP	10uF	20%	16V
C340	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C341	1-124-779-00	ELECT CHIP	10uF	20%	16V
C342	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C343	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C344	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C345	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C346	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C348	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C352	1-163-091-00	CERAMIC CHIP	8PF		50V
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C354	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C355	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C356	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C357	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C358	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C359	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C360	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C361	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C362	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C363	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C364	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C365	1-124-779-00	ELECT CHIP	10uF	20%	16V
C366	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C367	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C369	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C372	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
		< CONNECTOR >			
CN301	1-779-212-11	CONNECTOR, FFC/FPC 21P			
CN302	1-770-216-11	PIN, CONNECTOR (PC BOARD) 5P			
CN303	1-774-115-11	CONNECTOR, (FFC/FPC) 29P			
CN304	1-774-115-11	CONNECTOR, (FFC/FPC) 29P			
		< TRIMMER >			
CT301	1-141-424-11	CAP, ADJ			
		< DIODE >			
D301	8-719-976-96	DIODE DTZ4.7C			
D302	8-719-018-51	DIODE CL-170R-CD (CHECK)			
		< FERRITE BEAD >			
FB301	1-414-234-22	INDUCTOR CHIP 0UH			
		< IC >			
IC301	8-759-446-70	IC HD6433032SK07F			
IC302	8-759-336-84	IC LC3564SM-10			
IC303	8-759-058-64	IC TC7S32FU(TE85R)			
IC304	8-759-927-72	IC TL1591CP			
IC305	8-752-389-31	IC CXD1852AQ			
IC306	8-759-490-76	IC MSM514260C-60TS-K			
IC307	8-759-269-92	IC SN74HCU04ANS-E20			
IC308	8-759-269-92	IC SN74HCU04ANS-E20			
IC309	8-759-269-92	IC SN74HCU04ANS-E20			
IC310	8-752-380-71	IC CXD1913Q			
IC311	8-759-636-20	IC M54641FP-TP			
		< COIL >			
L301	1-412-784-41	INDUCTOR 4.7uH			
L302	1-412-784-41	INDUCTOR 4.7uH			
		< TRANSISTOR >			
Q301	8-729-140-75	TRANSISTOR 2SD999-CLCK			
⚠Q302	8-729-010-29	TRANSISTOR MSD601-RST1			
Q303	8-729-010-29	TRANSISTOR MSD601-RST1			
Q304	8-729-010-29	TRANSISTOR MSD601-RST1			
Q305	8-729-010-29	TRANSISTOR MSD601-RST1			

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

CD-169 **HI-66**

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R301	1-216-025-91	RES,CHIP	100	5%	1/10W
R302	1-216-025-91	RES,CHIP	100	5%	1/10W
R303	1-216-025-91	RES,CHIP	100	5%	1/10W
R305	1-216-073-00	METAL CHIP	10K	5%	1/10W
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-073-00	METAL CHIP	10K	5%	1/10W
R308	1-216-073-00	METAL CHIP	10K	5%	1/10W
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W
R311	1-216-025-91	RES,CHIP	100	5%	1/10W
R312	1-216-025-91	RES,CHIP	100	5%	1/10W
R313	1-216-073-00	METAL CHIP	10K	5%	1/10W
R314	1-216-073-00	METAL CHIP	10K	5%	1/10W
R315	1-216-073-00	METAL CHIP	10K	5%	1/10W
R316	1-216-025-91	RES,CHIP	100	5%	1/10W
R317	1-216-025-91	RES,CHIP	100	5%	1/10W
R318	1-216-025-91	RES,CHIP	100	5%	1/10W
R319	1-216-025-91	RES,CHIP	100	5%	1/10W
R320	1-216-073-00	METAL CHIP	10K	5%	1/10W
R321	1-216-073-00	METAL CHIP	10K	5%	1/10W
R322	1-216-081-00	METAL CHIP	22K	5%	1/10W
R323	1-216-025-91	RES,CHIP	100	5%	1/10W
R324	1-216-073-00	METAL CHIP	10K	5%	1/10W
R325	1-216-025-91	RES,CHIP	100	5%	1/10W
R326	1-216-073-00	METAL CHIP	10K	5%	1/10W
R327	1-216-073-00	METAL CHIP	10K	5%	1/10W
R328	1-216-073-00	METAL CHIP	10K	5%	1/10W
R329	1-216-073-00	METAL CHIP	10K	5%	1/10W
R330	1-216-073-00	METAL CHIP	10K	5%	1/10W
R331	1-216-073-00	METAL CHIP	10K	5%	1/10W
R332	1-216-073-00	METAL CHIP	10K	5%	1/10W
R333	1-216-073-00	METAL CHIP	10K	5%	1/10W
R334	1-216-121-91	RES,CHIP	1M	5%	1/10W
R335	1-216-073-00	METAL CHIP	10K	5%	1/10W
R336	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R337	1-216-049-91	RES,CHIP	1K	5%	1/10W
R338	1-216-073-00	METAL CHIP	10K	5%	1/10W
R339	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R340	1-216-073-00	METAL CHIP	10K	5%	1/10W
R341	1-216-041-00	METAL CHIP	470	5%	1/10W
R342	1-216-121-91	RES,CHIP	1M	5%	1/10W
R343	1-216-025-91	RES,CHIP	100	5%	1/10W
R344	1-216-009-00	METAL CHIP	22	5%	1/10W
R345	1-216-009-00	METAL CHIP	22	5%	1/10W
R346	1-216-009-00	METAL CHIP	22	5%	1/10W
R347	1-216-073-00	METAL CHIP	10K	5%	1/10W
R348	1-216-047-91	RES,CHIP	820	5%	1/10W
R349	1-216-037-00	METAL CHIP	330	5%	1/10W
R350	1-216-037-00	METAL CHIP	330	5%	1/10W
R351	1-216-037-00	METAL CHIP	330	5%	1/10W
R352	1-216-025-91	RES,CHIP	100	5%	1/10W
R353	1-216-073-00	METAL CHIP	10K	5%	1/10W
R354	1-216-025-91	RES,CHIP	100	5%	1/10W
R355	1-216-025-91	RES,CHIP	100	5%	1/10W
R356	1-216-025-91	RES,CHIP	100	5%	1/10W
R357	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R358	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R359	1-216-033-00	METAL CHIP	220	5%	1/10W
R360	1-216-025-91	RES,CHIP	100	5%	1/10W
R361	1-216-025-91	RES,CHIP	100	5%	1/10W
R362	1-216-025-91	RES,CHIP	100	5%	1/10W
R364	1-216-295-91	SHORT	0		
R365	1-216-664-11	METAL CHIP	3.6K	0.5%	1/10W
R366	1-216-075-00	METAL CHIP	12K	5%	1/10W
R367	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R368	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R369	1-216-121-91	RES,CHIP	1M	5%	1/10W
R370	1-216-017-91	RES,CHIP	47	5%	1/10W
R371	1-216-031-00	METAL CHIP	180	5%	1/10W
R372	1-216-041-00	METAL CHIP	470	5%	1/10W
R373	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R374	1-216-033-00	METAL CHIP	220	5%	1/10W
R375	1-216-031-00	METAL CHIP	180	5%	1/10W
R376	1-216-295-91	SHORT	0		
R377	1-216-025-91	RES,CHIP	100	5%	1/10W
R378	1-216-031-00	METAL CHIP	180	5%	1/10W
R379	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R380	1-216-041-00	METAL CHIP	470	5%	1/10W
R381	1-216-049-91	RES,CHIP	1K	5%	1/10W
R382	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R383	1-216-025-91	RES,CHIP	100	5%	1/10W
R384	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R385	1-216-025-91	RES,CHIP	100	5%	1/10W
		< VIBRATOR >			
X301	1-760-503-11	VIBRATOR, CRYSTAL 28.636MHz			
X302	1-767-211-11	VIBRATOR, CERAMIC 10MHz			
X303	1-767-055-11	VIBRATOR, CERAMIC 45MHz			
X304	1-767-212-11	VIBRATOR, CRYSTAL 27MHz			
*	A-6794-576-A	HI-66 BOARD, COMPLETE			
		**********			
					(Ref.No.4,000 series)
		< CAPACITOR >			
C201	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C202	1-104-905-11	CAPACITOR	0.22F		5.5V
C211	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C223	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C234	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C235	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C290	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C303	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C321	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN290	1-691-068-21	HOUSING, CONNECTOR 9P			
CN301	1-691-078-41	HOUSING, CONNECTOR 19P			
CN302	1-778-991-11	CONNECTOR, FFC/FPC 21P			
CN303	1-563-614-31	HOUSING, CONNECTOR 11P			
CN304	1-691-644-11	SOCKET, CONNECTOR 7P			
CN305	1-785-580-11	CONNECTOR, FFC/FPC 23P			

Ref. No.	Part No.	Description			Remarks
		< DIODE >			
D273	8-719-026-08	DIODE GL4HY8			
D275	8-719-026-08	DIODE GL4HY8			
D276	8-719-026-08	DIODE GL4HY8			
D278	8-719-045-62	DIODE SLR-342VC-A-47			
D290	8-719-045-43	DIODE GL3HY44			
D291	8-719-045-43	DIODE GL3HY44			
D292	8-719-045-43	DIODE GL3HY44			
D293	8-719-045-43	DIODE GL3HY44			
D294	8-719-045-43	DIODE GL3HY44			
D295	8-719-045-43	DIODE GL3HY44			
D296	8-719-045-43	DIODE GL3HY44			
D297	8-719-045-43	DIODE GL3HY44			
D298	8-719-057-24	DIODE SLR-342MG			
D299	8-719-057-24	DIODE SLR-342MG			
D301	8-719-040-57	DIODE 015Z8.2-XY-TPH3			
		< IC >			
IC201	8-752-892-00	IC CXP82960-070Q			
IC202	8-759-248-87	IC MM1256XF-BE			
IC321	8-759-166-03	IC M50253PK			
		< JUMPER CHIP >			
JS201	1-216-296-00	METAL CHIP	0	5%	1/8W
		< PIN >			
LP201	4-352-844-01	PIN, LEAD, COATING			
LP202	4-352-844-01	PIN, LEAD, COATING			
		< FLUORECENT INDICATOR >			
ND301	1-517-631-11	154231411ORESCENT INDICATOR			
		< TRANSISTOR >			
Q295	8-729-421-19	TRANSISTOR UN2213			
Q296	8-729-010-05	TRANSISTOR MSB709-RT1			
Q297	8-729-901-06	TRANSISTOR DTA144EK			
Q298	8-729-107-46	TRANSISTOR 2SC3624A-L15			
Q299	8-729-107-46	TRANSISTOR 2SC3624A-L15			
		< RESISTOR >			
R211	1-216-035-00	METAL CHIP	270	5%	1/10W
R212	1-216-184-00	RES,CHIP	270	5%	1/8W
R213	1-216-184-00	RES,CHIP	270	5%	1/8W
R214	1-216-041-00	METAL CHIP	470	5%	1/10W
R215	1-216-035-00	METAL CHIP	270	5%	1/10W
R216	1-216-184-00	RES,CHIP	270	5%	1/8W
R217	1-216-079-00	METAL CHIP	18K	5%	1/10W
R219	1-216-035-00	METAL CHIP	270	5%	1/10W
R220	1-216-035-00	METAL CHIP	270	5%	1/10W
R221	1-216-035-00	METAL CHIP	270	5%	1/10W
R223	1-216-113-00	METAL CHIP	470K	5%	1/10W
R224	1-216-049-00	METAL CHIP	1K	5%	1/10W
R225	1-216-097-91	RES,CHIP	100K	5%	1/10W
R226	1-216-073-00	METAL CHIP	10K	5%	1/10W
R227	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R229	1-216-035-00	METAL CHIP	270	5%	1/10W
R230	1-216-035-00	METAL CHIP	270	5%	1/10W
R231	1-216-035-00	METAL CHIP	270	5%	1/10W
R232	1-216-035-00	METAL CHIP	270	5%	1/10W
R234	1-216-035-00	METAL CHIP	270	5%	1/10W
R235	1-216-035-00	METAL CHIP	270	5%	1/10W
R236	1-216-035-00	METAL CHIP	270	5%	1/10W
R237	1-216-035-00	METAL CHIP	270	5%	1/10W
R238	1-216-035-00	METAL CHIP	270	5%	1/10W
R239	1-216-089-00	METAL CHIP	47K	5%	1/10W
R240	1-216-035-00	METAL CHIP	270	5%	1/10W
R241	1-216-073-00	METAL CHIP	10K	5%	1/10W
R242	1-216-073-00	METAL CHIP	10K	5%	1/10W
R244	1-216-073-00	METAL CHIP	10K	5%	1/10W
R249	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R250	1-216-081-00	METAL CHIP	22K	5%	1/10W
R251	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R253	1-216-295-00	METAL CHIP	0	5%	1/10W
R254	1-216-073-00	METAL CHIP	10K	5%	1/10W
R255	1-216-081-00	METAL CHIP	22K	5%	1/10W
R256	1-216-220-00	RES,CHIP	8.2K	5%	1/8W
R257	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R258	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R259	1-216-049-00	METAL CHIP	1K	5%	1/10W
R260	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R261	1-216-073-00	METAL CHIP	10K	5%	1/10W
R262	1-216-031-00	METAL CHIP	180	5%	1/10W
R264	1-216-035-00	METAL CHIP	270	5%	1/10W
R265	1-216-035-00	METAL CHIP	270	5%	1/10W
R267	1-216-035-00	METAL CHIP	270	5%	1/10W
R270	1-216-073-00	METAL CHIP	10K	5%	1/10W
R271	1-216-073-00	METAL CHIP	10K	5%	1/10W
R272	1-216-073-00	METAL CHIP	10K	5%	1/10W
R273	1-216-073-00	METAL CHIP	10K	5%	1/10W
R274	1-216-095-00	METAL CHIP	82K	5%	1/10W
R290	1-216-021-00	METAL CHIP	68	5%	1/10W
R291	1-216-198-91	RES,CHIP	1K	5%	1/8W
R292	1-216-021-00	METAL CHIP	68	5%	1/10W
R294	1-216-021-00	METAL CHIP	68	5%	1/10W
R296	1-216-021-00	METAL CHIP	68	5%	1/10W
R297	1-216-073-00	METAL CHIP	10K	5%	1/10W
R298	1-216-198-91	RES,CHIP	1K	5%	1/8W
R299	1-216-073-00	METAL CHIP	10K	5%	1/10W
R300	1-216-198-91	RES,CHIP	1K	5%	1/8W
R301	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R304	1-216-097-91	RES,CHIP	100K	5%	1/10W
R305	1-216-097-91	RES,CHIP	100K	5%	1/10W
R306	1-216-097-91	RES,CHIP	100K	5%	1/10W
R307	1-216-246-00	RES,CHIP	100K	5%	1/8W
R308	1-216-246-00	RES,CHIP	100K	5%	1/8W
R309	1-216-097-91	RES,CHIP	100K	5%	1/10W
R310	1-216-097-91	RES,CHIP	100K	5%	1/10W
R311	1-216-097-91	RES,CHIP	100K	5%	1/10W
R368	1-216-073-00	METAL CHIP	10K	5%	1/10W
R369	1-216-073-00	METAL CHIP	10K	5%	1/10W

HI-66 **IO-65**

Ref. No.	Part No.	Description			Remarks
R370	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R371	1-216-027-00	METAL CHIP	120	5%	1/10W
R372	1-216-027-00	METAL CHIP	120	5%	1/10W
R373	1-216-089-00	METAL CHIP	47K	5%	1/10W
R374	1-216-089-00	METAL CHIP	47K	5%	1/10W
R375	1-216-035-00	METAL CHIP	270	5%	1/10W
R376	1-216-089-00	METAL CHIP	47K	5%	1/10W
		< VARIABLE RESISTOR >			
RV290	1-225-442-11	RES, VAR, CARBON 10K (MIC VOL 1)			
RV291	1-225-442-11	RES, VAR, CARBON 10K (MIC VOL 2)			
RV292	1-225-442-11	RES, VAR, CARBON 10K (ECHO)			
		< SWITCH >			
S250	1-572-907-11	SWITCH, SLIDE (KARAOKE MODE)			
S251	1-572-596-11	SWITCH, KEY BOARD (KARAOKE ON/OFF)			
S252	1-572-596-11	SWITCH, KEY BOARD (#)			
S253	1-572-596-11	SWITCH, KEY BOARD (b)			
S255	1-572-596-11	SWITCH, KEY BOARD (+)			
S256	1-572-596-11	SWITCH, KEY BOARD (-)			
S257	1-572-596-11	SWITCH, KEY BOARD (VCD)			
S258	1-572-596-11	SWITCH, KEY BOARD (VHS)			
S260	1-572-907-11	SWITCH, SLIDE (DIGITAL SOUND EFFECTOR)			
		< VIBRATOR >			
X201	1-760-995-21	VIBRATOR, CERAMIC 16MHz			
X202	1-579-463-11	VIBRATOR, CRYSTAL 32KHz			
*	A-6794-575-A	IO-65 BOARD, COMPLETE **********			
		(Ref.No.4,000 series)			
		< CAPACITOR >			
C401	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C402	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C403	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
		< CONNECTOR >			
CN401	1-563-614-31	HOUSING, CONNECTOR 11P			
CN402	1-573-737-11	PIN, CONNECTOR 10P			
		< DIODE >			
D401	8-719-046-08	DIODE SLN-210MC			
D402	8-719-946-48	DIODE SLN-210LT			
D403	8-719-057-24	DIODE SLR-342MG			
D404	8-719-057-24	DIODE SLR-342MG			
D405	8-719-057-24	DIODE SLR-342MG			
D406	8-719-057-24	DIODE SLR-342MG			
D407	8-719-045-43	DIODE GL3HY44			
D408	8-719-046-08	DIODE SLN-210MC			
D409	8-719-108-12	DIODE RD9.1E-W			
D410	8-719-108-12	DIODE RD9.1E-W			
D411	8-719-108-12	DIODE RD9.1E-W			
D412	8-719-108-12	DIODE RD9.1E-W			
D413	8-719-108-12	DIODE RD9.1E-W			
D414	8-719-108-12	DIODE RD9.1E-W			
D415	8-719-108-12	DIODE RD9.1E-W			
D416	8-719-108-12	DIODE RD9.1E-W			

Ref. No.	Part No.	Description			Remarks
		< JACK >			
J401	1-580-845-11	JACK, PIN 3P (LINE-2 IN)			
J402	1-580-845-11	JACK, PIN 3P (LINE-2 OUT)			
		< TRANSISTOR >			
Q401	8-729-421-19	TRANSISTOR UN2213			
Q402	8-729-900-51	TRANSISTOR DTA114TK			
		< RESISTOR >			
R401	1-216-081-00	METAL CHIP	22K	5%	1/10W
R402	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R403	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R404	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R405	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R406	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R407	1-216-049-00	METAL CHIP	1K	5%	1/10W
R408	1-216-041-00	METAL CHIP	470	5%	1/10W
R409	1-216-041-00	METAL CHIP	470	5%	1/10W
R410	1-216-041-00	METAL CHIP	470	5%	1/10W
R411	1-216-041-00	METAL CHIP	470	5%	1/10W
R412	1-216-035-00	METAL CHIP	270	5%	1/10W
R413	1-216-609-11	METAL CHIP	18	0.5%	1/10W
R414	1-216-035-00	METAL CHIP	270	5%	1/10W
R415	1-216-081-00	METAL CHIP	22K	5%	1/10W
R416	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R417	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R418	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R419	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R420	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R421	1-216-049-00	METAL CHIP	1K	5%	1/10W
R422	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R423	1-216-033-00	METAL CHIP	220	5%	1/10W
R424	1-216-033-00	METAL CHIP	220	5%	1/10W
R425	1-216-021-00	METAL CHIP	68	5%	1/10W
R426	1-216-022-00	METAL CHIP	75	5%	1/10W
R427	1-216-049-00	METAL CHIP	1K	5%	1/10W
R428	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		< SWITCH >			
S401	1-572-907-11	SWITCH, SLIDE (KARAOKE MODE)			
S402	1-572-596-11	SWITCH, KEY BOARD (KARAOKE ON/OFF)			
S403	1-572-596-11	SWITCH, KEY BOARD (VCD)			
S404	1-572-596-11	SWITCH, KEY BOARD (2)			
S405	1-572-596-11	SWITCH, KEY BOARD (1)			
S406	1-571-977-11	SWITCH, TACTIL (VCD STOP)			
S407	1-571-977-11	SWITCH, TACTIL (MENU +)			
S408	1-571-977-11	SWITCH, TACTIL (NEXT)			
S409	1-571-977-11	SWITCH, TACTIL (VCD PLAY)			
S410	1-571-977-11	SWITCH, TACTIL (PREV)			
S411	1-571-977-11	SWITCH, TACTIL (MENU -)			
S412	1-571-977-11	SWITCH, TACTIL (ON/STANDBY)			
S413	1-571-977-11	SWITCH, TACTIL (OPEN/CLOSE)			
S414	1-571-977-11	SWITCH, TACTIL (RETURN)			
S415	1-571-977-11	SWITCH, TACTIL (PAUSE)			

Ref. No.	Part No.	Description	Remarks
*	1-645-721-11	LOADING BOARD CDM-14	
		**********	
		(Ref.No.3,000 series)	
		< CONNECTOR >	
* CN151	1-568-943-11	PIN, CONNECTOR 5P	
		< SWITCH >	
S151	1-572-086-11	SWITCH, LEAF (LOAD OUT)	
S152	1-572-086-11	SWITCH, LEAF (LOAD IN)	
*	A-6791-683-A	MA-303 BOARD, COMPLETE	
		**********	
		(Ref.No.1,000 series)	
*	3-960-273-01	SPACER, TOP END	
*	3-960-274-01	SPACER, LED	
	4-352-844-01	PIN, LEAD, COATING	
		< CAPACITOR >	
C101	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C102	1-124-589-11	ELECT 47uF 20%	16V
C103	1-164-344-11	CERAMIC CHIP 0.068uF 10%	25V
C104	1-126-153-11	ELECT 22uF 20%	6.3V
C105	1-124-584-00	ELECT 100uF 20%	10V
C106	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C107	1-163-017-00	CERAMIC CHIP 0.0047uF 5%	50V
C108	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C109	1-124-257-00	ELECT 2.2uF 20%	50V
C111	1-124-257-00	ELECT 2.2uF 20%	50V
C201	1-163-229-11	CERAMIC CHIP 12PF 5%	50V
C202	1-163-229-11	CERAMIC CHIP 12PF 5%	50V
C204	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C205	1-164-489-11	CERAMIC CHIP 0.22uF 10%	16V
C206	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C207	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C208	1-124-584-00	ELECT 100uF 20%	10V
C209	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C211	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C212	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C252	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C253	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C254	1-124-584-00	ELECT 100uF 20%	10V
C255	1-130-489-00	MYLAR 0.033uF 5%	50V
C256	1-137-441-11	FILM 0.027uF 5%	50V
C261	1-124-584-00	ELECT 100uF 20%	10V
C262	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C264	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C266	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C267	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C273	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C291	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C292	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C294	1-124-589-11	ELECT 47uF 20%	16V
C295	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C296	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C301	1-163-021-91	CERAMIC CHIP 0.01uF 10%	50V
C302	1-163-235-11	CERAMIC CHIP 22PF 5%	50V
C303	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C304	1-163-235-11	CERAMIC CHIP 22PF 5%	50V
C305	1-162-306-11	CERAMIC 0.01uF 20%	16V
C306	1-163-021-91	CERAMIC CHIP 0.01uF 10%	50V
C308	1-163-235-11	CERAMIC CHIP 22PF 5%	50V
C310	1-163-127-00	CERAMIC CHIP 270PF 5%	50V
C311	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C312	1-163-135-00	CERAMIC CHIP 560PF 5%	50V
C313	1-163-113-00	CERAMIC CHIP 68PF 5%	50V
C314	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C315	1-163-259-91	CERAMIC CHIP 220PF 5%	50V
C316	1-163-233-11	CERAMIC CHIP 18PF 5%	50V
C317	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C319	1-163-257-11	CERAMIC CHIP 180PF 5%	50V
C320	1-124-589-11	ELECT 47uF 20%	16V
C321	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C322	1-163-235-11	CERAMIC CHIP 22PF 5%	50V
C323	1-163-233-11	CERAMIC CHIP 18PF 5%	50V
C324	1-163-127-00	CERAMIC CHIP 270PF 5%	50V
C325	1-163-249-11	CERAMIC CHIP 82PF 5%	50V
C326	1-163-237-11	CERAMIC CHIP 27PF 5%	50V
C327	1-163-235-11	CERAMIC CHIP 22PF 5%	50V
C329	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C330	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C331	1-124-499-11	ELECT, NONPOLAR 1uF 20%	50V
C332	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C333	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C334	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C335	1-126-160-11	ELECT 1uF 20%	50V
C336	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C337	1-126-157-11	ELECT 10uF 20%	16V
C338	1-163-139-00	CERAMIC CHIP 820PF 5%	50V
C339	1-126-160-11	ELECT 1uF 20%	50V
C340	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C341	1-124-584-00	ELECT 100uF 20%	10V
C342	1-126-153-11	ELECT 22uF 20%	6.3V
C343	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C344	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C345	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C346	1-126-157-11	ELECT 10uF 20%	16V
C347	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C348	1-126-160-11	ELECT 1uF 20%	50V
C349	1-124-589-11	ELECT 47uF 20%	16V
C350	1-126-157-11	ELECT 10uF 20%	16V
C351	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C352	1-126-160-11	ELECT 1uF 20%	50V
C353	1-126-160-11	ELECT 1uF 20%	50V
C354	1-163-253-11	CERAMIC CHIP 120PF 5%	50V
C355	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C356	1-126-160-11	ELECT 1uF 20%	50V
C358	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C359	1-163-038-91	CERAMIC CHIP 0.1uF	25V

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Ref. No.	Part No.	Description			Remarks
C360	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C361	1-162-306-11	CERAMIC	0.01uF	20%	16V
C362	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C363	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C364	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C365	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C366	1-124-589-11	ELECT	47uF	20%	16V
C368	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C369	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C370	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C371	1-124-589-11	ELECT	47uF	20%	16V
C372	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C401	1-124-584-00	ELECT	100uF	20%	10V
C402	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C403	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C404	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C405	1-124-589-11	ELECT	47uF	20%	16V
C406	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C407	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C408	1-124-589-11	ELECT	47uF	20%	16V
C409	1-124-584-00	ELECT	100uF	20%	10V
C410	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C415	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C416	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C417	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C418	1-126-160-11	ELECT	1uF	20%	50V
C420	1-130-481-00	MYLAR	0.0068uF	5%	50V
C421	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C422	1-137-372-11	FILM	0.022uF	5%	50V
C423	1-124-465-00	ELECT	0.47uF	20%	50V
C424	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C425	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C501	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C502	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C503	1-124-589-11	ELECT	47uF	20%	16V
C510	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C520	1-126-163-11	ELECT	4.7uF	20%	50V
C521	1-126-964-11	ELECT	10uF	20%	50V
C522	1-137-372-11	FILM	0.022uF	5%	50V
C523	1-126-163-11	ELECT	4.7uF	20%	50V
C524	1-124-589-11	ELECT	47uF	20%	16V
C525	1-137-370-11	FILM	0.01uF	5%	50V
C530	1-126-163-11	ELECT	4.7uF	20%	50V
C531	1-126-964-11	ELECT	10uF	20%	50V
C532	1-137-372-11	FILM	0.022uF	5%	50V
C533	1-126-163-11	ELECT	4.7uF	20%	50V
C534	1-124-589-11	ELECT	47uF	20%	16V
C535	1-137-370-11	FILM	0.01uF	5%	50V
C541	1-137-372-11	FILM	0.022uF	5%	50V
C542	1-124-584-00	ELECT	100uF	20%	10V
C551	1-126-163-11	ELECT	4.7uF	20%	50V
C552	1-126-153-11	ELECT	22uF	20%	6.3V
C561	1-126-160-11	ELECT	1uF	20%	50V
C562	1-137-370-11	FILM	0.01uF	5%	50V
C563	1-126-163-11	ELECT	4.7uF	20%	50V

Ref. No.	Part No.	Description			Remarks
C565	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C566	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C571	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C572	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C574	1-124-257-00	ELECT	2.2uF	20%	50V
C591	1-104-665-11	ELECT	100uF	20%	25V
C592	1-104-665-11	ELECT	100uF	20%	25V
C593	1-124-589-11	ELECT	47uF	20%	16V
C701	1-124-589-11	ELECT	47uF	20%	16V
C702	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C703	1-216-295-00	METAL CHIP	0	5%	1/10W
C801	1-124-257-00	ELECT	2.2uF	20%	50V
C802	1-124-261-00	ELECT	10uF	20%	50V
C803	1-124-257-00	ELECT	2.2uF	20%	50V
C804	1-164-159-21	CERAMIC	0.1uF		50V
C805	1-124-257-00	ELECT	2.2uF	20%	50V
C806	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C807	1-124-257-00	ELECT	2.2uF	20%	50V
C865	1-126-163-11	ELECT	4.7uF	20%	50V
C866	1-128-551-11	ELECT	22uF	20%	25V
C867	1-126-964-11	ELECT	10uF	20%	50V
C868	1-128-551-11	ELECT	22uF	20%	25V
C869	1-126-163-11	ELECT	4.7uF	20%	50V
C874	1-124-257-00	ELECT	2.2uF	20%	50V
C875	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C876	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C877	1-124-248-00	ELECT	22uF	20%	35V
C881	1-137-612-11	FILM	0.0068uF	5%	100V
C882	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C883	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C884	1-126-382-11	ELECT	100uF	20%	16V
C885	1-107-737-11	FILM	560PF	5%	100V
C888	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C889	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C891	1-104-697-11	FILM	0.047uF	5%	100V
C892	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C893	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C894	1-126-382-11	ELECT	100uF	20%	16V
C905	1-124-584-00	ELECT	100uF	20%	10V

< CONNECTOR >

	CN101	1-506-468-11	PIN, CONNECTOR 3P
*	CN102	1-564-028-00	PIN, CONNECTOR 3P
*	CN271	1-766-538-11	CONNECTOR, BOARD TO BOARD 8P
*	CN275	1-573-128-11	PIN, CONNECTOR 5P
*	CN281	1-766-537-11	CONNECTOR (HMD) 5P
*	CN291	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P
	CN301	1-573-847-11	CONNECTOR, BOARD TO BOARD 15P
*	CN501	1-766-600-11	CONNECTOR, BOARD TO BOARD 7P
*	CN701	1-560-893-00	PIN, CONNECTOR 5P
	CN801	1-691-055-21	HOUSING, CONNECTOR 23P
*	CN881	1-560-892-00	PIN, CONNECTOR 4P
*	CN891	1-560-891-00	PIN, CONNECTOR 3P
	CN901	1-691-078-41	HOUSING, CONNECTOR 19P
	CN911	1-506-473-11	PIN, CONNECTOR 8P
	CN912	1-506-474-11	PIN, CONNECTOR 9P

Ref. No.	Part No.	Description	Remarks
		< TRIMMER >	
CT401	1-141-334-11	CAP, TRIMMER 30PF	
		< DIODE >	
⚠D201	8-719-200-82	DIODE 11ES2	
D202	8-719-991-33	DIODE 1SS133T-77	
D251	8-719-991-33	DIODE 1SS133T-77	
D261	8-719-048-26	DIODE GL528V1	
D265	8-719-109-93	DIODE RD6.2ESB2	
D267	8-719-109-93	DIODE RD6.2ESB2	
D268	8-719-991-33	DIODE 1SS133T-77	
D291	8-719-110-14	DIODE RD9.1ES-B3	
D304	8-719-991-33	DIODE 1SS133T-77	
D305	8-719-991-33	DIODE 1SS133T-77	
D306	8-719-991-33	DIODE 1SS133T-77	
D307	8-719-991-33	DIODE 1SS133T-77	
D308	8-719-991-33	DIODE 1SS133T-77	
D401	8-719-991-33	DIODE 1SS133T-77	
D403	8-719-991-33	DIODE 1SS133T-77	
D591	8-719-991-33	DIODE 1SS133T-77	
⚠D701	8-719-200-82	DIODE 11ES2	
D801	8-719-800-76	DIODE 1SS226	
D802	8-719-800-76	DIODE 1SS226	
D803	8-719-109-85	DIODE RD5.1ES-B2	
D804	8-719-109-85	DIODE RD5.1ES-B2	
D805	8-719-800-76	DIODE 1SS226	
D806	8-719-109-85	DIODE RD5.1ES-B2	
D807	8-719-800-76	DIODE 1SS226	
⚠D901	8-719-200-82	DIODE 11ES2	
D902	8-719-991-33	DIODE 1SS133T-77	
		< IC >	
IC101	8-759-246-14	IC TA8823N	
IC201	8-752-882-93	IC CXP87360-048Q	
IC251	8-759-335-76	IC UPC5023GR-089-E2	
⚠IC291	8-759-294-26	IC BA6209-V2	
IC301	8-759-295-66	IC BA7653AF-E2	
IC302	8-759-334-17	IC LA7432M-MPB	
IC303	8-752-372-11	IC CXL1510M-T6	
IC304	1-810-636-11	IC LA7356M-TLM	
IC401	8-759-458-40	IC LC74761M-9647-TLM	
IC501	8-759-493-25	IC BH7779K-VP	
IC551	8-759-499-30	IC BA7755AF-E2	
IC801	8-759-932-69	IC BU4053BCF-T2	
IC802	8-759-924-48	IC BA4560F-T2	
IC812	8-759-909-71	IC BA4558F	
IC813	8-759-933-22	IC BA3707	
		< JUMPER RESISTOR >	
JR001	1-216-296-00	METAL CHIP 0 5%	1/8W
JR002	1-216-296-00	METAL CHIP 0 5%	1/8W
JR003	1-216-295-00	METAL CHIP 0 5%	1/10W
JR004	1-216-296-00	METAL CHIP 0 5%	1/8W
JR005	1-216-296-00	METAL CHIP 0 5%	1/8W

Ref. No.	Part No.	Description	Remarks
JR006	1-216-295-00	METAL CHIP 0 5%	1/10W
JR007	1-216-295-00	METAL CHIP 0 5%	1/10W
JR008	1-216-296-00	METAL CHIP 0 5%	1/8W
JR009	1-216-296-00	METAL CHIP 0 5%	1/8W
JR010	1-216-296-00	METAL CHIP 0 5%	1/8W
JR011	1-216-296-00	METAL CHIP 0 5%	1/8W
JR013	1-216-296-00	METAL CHIP 0 5%	1/8W
JR014	1-216-295-00	METAL CHIP 0 5%	1/10W
JR015	1-216-295-00	METAL CHIP 0 5%	1/10W
JR016	1-216-295-00	METAL CHIP 0 5%	1/10W
JR019	1-216-296-00	METAL CHIP 0 5%	1/8W
JR021	1-216-295-00	METAL CHIP 0 5%	1/10W
JR023	1-216-295-00	METAL CHIP 0 5%	1/10W
JR024	1-216-295-00	METAL CHIP 0 5%	1/10W
JR025	1-216-296-00	METAL CHIP 0 5%	1/8W
JR026	1-216-296-00	METAL CHIP 0 5%	1/8W
JR027	1-216-296-00	METAL CHIP 0 5%	1/8W
JR028	1-216-296-00	METAL CHIP 0 5%	1/8W
JR029	1-216-296-00	METAL CHIP 0 5%	1/8W
JR031	1-216-296-00	METAL CHIP 0 5%	1/8W
JR032	1-216-296-00	METAL CHIP 0 5%	1/8W
JR033	1-216-296-00	METAL CHIP 0 5%	1/8W
JR034	1-216-296-00	METAL CHIP 0 5%	1/8W
JR035	1-216-296-00	METAL CHIP 0 5%	1/8W
JR037	1-216-296-00	METAL CHIP 0 5%	1/8W
JR038	1-216-295-00	METAL CHIP 0 5%	1/10W
JR039	1-216-295-00	METAL CHIP 0 5%	1/10W
JR040	1-216-295-00	METAL CHIP 0 5%	1/10W
JR042	1-216-296-00	METAL CHIP 0 5%	1/8W
JR043	1-216-296-00	METAL CHIP 0 5%	1/8W
JS302	1-216-296-00	METAL CHIP 0 5%	1/8W
JS601	1-216-295-00	METAL CHIP 0 5%	1/10W
		< COIL >	
L101	1-410-521-11	INDUCTOR 100uH	
L201	1-408-970-21	INDUCTOR 10uH	
L301	1-408-982-11	INDUCTOR 100uH	
L302	1-408-978-21	INDUCTOR 47uH	
L303	1-410-521-11	INDUCTOR 100uH	
L304	1-408-974-21	INDUCTOR 22uH	
L305	1-408-948-00	INDUCTOR 220uH	
L306	1-408-978-21	INDUCTOR 47uH	
L307	1-408-974-21	INDUCTOR 22uH	
L308	1-408-978-21	INDUCTOR 47uH	
L309	1-408-978-21	INDUCTOR 47uH	
L310	1-408-982-11	INDUCTOR 100uH	
L311	1-408-984-21	INDUCTOR 150uH	
L312	1-408-982-11	INDUCTOR 100uH	
L313	1-408-982-11	INDUCTOR 100uH	
L314	1-408-978-21	INDUCTOR 47uH	
L401	1-410-521-11	INDUCTOR 100uH	
L402	1-408-982-11	INDUCTOR 100uH	
L403	1-410-513-11	INDUCTOR 22uH	
L404	1-408-967-21	INDUCTOR 5.6uH	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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Ref. No.	Part No.	Description	Remarks
L405	1-408-982-11	INDUCTOR 100uH	
L701	1-410-501-11	INDUCTOR 2.2uH	
L802	1-408-978-21	INDUCTOR 47uH	
L881	1-410-687-11	INDUCTOR 1.2mH	
L891	1-410-687-11	INDUCTOR 1.2mH	
L901	1-410-509-11	INDUCTOR 10uH	
L902	1-410-509-11	INDUCTOR 10uH	
L903	1-410-509-11	INDUCTOR 10uH	
⚠L904	1-403-588-11	INDUCTOR 22uH	
		< PHOTO INTERUPTER >	
PH261	8-749-010-19	PHOTO INTERRUPTER GP3S113	
PH262	8-749-010-20	PHOTO INTERRUPTER GP3S114	
		< IC LINK >	
⚠PS271	1-532-727-11	LINK, IC 0.25A	
⚠PS885	1-532-727-11	LINK, IC 0.25A	
		< TRANSISTOR >	
Q201	8-729-010-29	TRANSISTOR MSD601-RST1	
Q261	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q262	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q263	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q301	8-729-010-29	TRANSISTOR MSD601-RST1	
Q302	8-729-421-19	TRANSISTOR UN2213	
Q303	8-729-010-29	TRANSISTOR MSD601-RST1	
Q304	8-729-421-19	TRANSISTOR UN2213	
Q306	8-729-901-06	TRANSISTOR DTA144EK	
Q307	8-729-010-29	TRANSISTOR MSD601-RST1	
Q308	8-729-901-06	TRANSISTOR DTA144EK	
Q309	8-729-010-29	TRANSISTOR MSD601-RST1	
Q310	8-729-421-19	TRANSISTOR UN2213	
Q311	8-729-421-19	TRANSISTOR UN2213	
Q312	8-729-010-05	TRANSISTOR MSB709-RT1	
Q313	8-729-421-19	TRANSISTOR UN2213	
Q314	8-729-010-05	TRANSISTOR MSB709-RT1	
Q315	8-729-421-19	TRANSISTOR UN2213	
Q316	8-729-010-29	TRANSISTOR MSD601-RST1	
Q317	8-729-421-19	TRANSISTOR UN2213	
Q319	8-729-901-06	TRANSISTOR DTA144EK	
Q320	8-729-010-29	TRANSISTOR MSD601-RST1	
Q321	8-729-010-05	TRANSISTOR MSB709-RT1	
Q322	8-729-901-06	TRANSISTOR DTA144EK	
Q404	8-729-010-05	TRANSISTOR MSB709-RT1	
Q405	8-729-010-05	TRANSISTOR MSB709-RT1	
Q522	8-729-421-19	TRANSISTOR UN2213	
Q532	8-729-421-19	TRANSISTOR UN2213	
⚠Q591	8-729-804-41	TRANSISTOR 2SB1122-S	
⚠Q592	8-729-820-68	TRANSISTOR 2SD1802FA-S	
Q631	8-729-010-29	TRANSISTOR MSD601-RST1	
Q641	8-729-010-29	TRANSISTOR MSD601-RST1	
Q804	8-729-421-19	TRANSISTOR UN2213	
Q805	8-729-010-29	TRANSISTOR MSD601-RST1	
Q806	8-729-010-29	TRANSISTOR MSD601-RST1	

Ref. No.	Part No.	Description	Remarks
⚠Q881	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
⚠Q882	8-729-900-51	TRANSISTOR DTA114TK	
Q886	8-729-010-29	TRANSISTOR MSD601-RST1	
⚠Q891	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
⚠Q892	8-729-900-51	TRANSISTOR DTA114TK	
Q893	8-729-421-19	TRANSISTOR UN2213	
Q894	8-729-010-05	TRANSISTOR MSB709-RT1	
		< RESISTOR >	
R101	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R102	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R103	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R104	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R105	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R106	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R107	1-216-037-00	METAL CHIP 330 5% 1/10W	
R108	1-216-121-91	RES,CHIP 1M 5% 1/10W	
R111	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R202	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R203	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R204	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R206	1-216-222-00	RES,CHIP 10K 5% 1/8W	
R207	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R208	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R209	1-216-222-00	RES,CHIP 10K 5% 1/8W	
R210	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R211	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R212	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R213	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R214	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R215	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R216	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R217	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R218	1-216-238-91	RES,CHIP 47K 5% 1/8W	
R220	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R221	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R222	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R224	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R225	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R226	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R227	1-249-429-11	CARBON 10K 5% 1/4W	
R228	1-249-429-11	CARBON 10K 5% 1/4W	
R233	1-249-417-11	CARBON 1K 5% 1/4W F	
R240	1-216-025-91	RES,CHIP 100 5% 1/10W	
R242	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R244	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R245	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R251	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R252	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R253	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R254	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R255	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R256	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R261	1-249-400-11	CARBON 39 5% 1/4W F	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
R262	1-249-400-11	CARBON	39	5%	1/4W F
R263	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R264	1-216-107-00	METAL CHIP	270K	5%	1/10W
R265	1-216-107-00	METAL CHIP	270K	5%	1/10W
R266	1-249-413-11	CARBON	470	5%	1/4W F
R267	1-216-089-00	METAL CHIP	47K	5%	1/10W
R268	1-216-089-00	METAL CHIP	47K	5%	1/10W
R271	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R274	1-216-083-00	METAL CHIP	27K	5%	1/10W
R275	1-216-093-00	METAL CHIP	68K	5%	1/10W
R276	1-216-056-00	RES,CHIP	2K	5%	1/10W
R277	1-216-068-00	METAL CHIP	6.2K	5%	1/10W
R278	1-216-075-00	METAL CHIP	12K	5%	1/10W
R281	1-216-089-00	METAL CHIP	47K	5%	1/10W
R282	1-216-089-00	METAL CHIP	47K	5%	1/10W
R283	1-216-089-00	METAL CHIP	47K	5%	1/10W
R284	1-216-089-00	METAL CHIP	47K	5%	1/10W
R293	1-216-295-00	METAL CHIP	0	5%	1/10W
R301	1-216-041-00	METAL CHIP	470	5%	1/10W
R302	1-216-049-00	METAL CHIP	1K	5%	1/10W
R303	1-216-295-00	METAL CHIP	0	5%	1/10W
R305	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R306	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R307	1-216-041-00	METAL CHIP	470	5%	1/10W
R308	1-216-041-00	METAL CHIP	470	5%	1/10W
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W
R310	1-216-073-00	METAL CHIP	10K	5%	1/10W
R312	1-216-041-00	METAL CHIP	470	5%	1/10W
R313	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R314	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R315	1-216-041-00	METAL CHIP	470	5%	1/10W
R316	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R317	1-216-081-00	METAL CHIP	22K	5%	1/10W
R318	1-216-081-00	METAL CHIP	22K	5%	1/10W
R319	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R320	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R321	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R322	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R323	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R324	1-216-041-00	METAL CHIP	470	5%	1/10W
R325	1-216-049-00	METAL CHIP	1K	5%	1/10W
R326	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R327	1-216-049-00	METAL CHIP	1K	5%	1/10W
R328	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R329	1-216-073-00	METAL CHIP	10K	5%	1/10W
R330	1-216-049-00	METAL CHIP	1K	5%	1/10W
R331	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R332	1-216-230-00	RES,CHIP	22K	5%	1/8W
R333	1-216-052-00	METAL CHIP	1.3K	5%	1/10W
R334	1-216-036-00	METAL CHIP	300	5%	1/10W
R337	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R338	1-216-295-00	METAL CHIP	0	5%	1/10W
R339	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R340	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R341	1-216-025-91	RES,CHIP	100	5%	1/10W
R342	1-216-295-00	METAL CHIP	0	5%	1/10W
R343	1-216-296-00	METAL CHIP	0	5%	1/8W
R345	1-216-077-00	METAL CHIP	15K	5%	1/10W
R346	1-216-295-00	METAL CHIP	0	5%	1/10W
R347	1-216-121-91	RES,CHIP	1M	5%	1/10W
R348	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R349	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R350	1-216-095-00	METAL CHIP	82K	5%	1/10W
R351	1-216-049-00	METAL CHIP	1K	5%	1/10W
R352	1-216-091-00	METAL CHIP	56K	5%	1/10W
R354	1-216-049-00	METAL CHIP	1K	5%	1/10W
R355	1-216-049-00	METAL CHIP	1K	5%	1/10W
R360	1-216-041-00	METAL CHIP	470	5%	1/10W
R361	1-216-049-00	METAL CHIP	1K	5%	1/10W
R362	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R370	1-216-029-00	METAL CHIP	150	5%	1/10W
R401	1-216-109-00	METAL CHIP	330K	5%	1/10W
R405	1-249-408-11	CARBON	180	5%	1/4W F
R413	1-216-025-91	RES,CHIP	100	5%	1/10W
R414	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R415	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R416	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R417	1-216-049-00	METAL CHIP	1K	5%	1/10W
R418	1-249-407-11	CARBON	150	5%	1/4W F
R419	1-216-089-00	METAL CHIP	47K	5%	1/10W
R420	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R421	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R422	1-216-049-00	METAL CHIP	1K	5%	1/10W
R423	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R424	1-216-295-00	METAL CHIP	0	5%	1/10W
R425	1-216-049-00	METAL CHIP	1K	5%	1/10W
R426	1-216-121-91	RES,CHIP	1M	5%	1/10W
R507	1-216-295-00	METAL CHIP	0	5%	1/10W
R508	1-216-049-00	METAL CHIP	1K	5%	1/10W
R509	1-216-049-00	METAL CHIP	1K	5%	1/10W
R510	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
⚠R511	1-215-912-11	METAL OXIDE	150	5%	3W F
R514	1-216-049-00	METAL CHIP	1K	5%	1/10W
R515	1-216-049-00	METAL CHIP	1K	5%	1/10W
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W
R522	1-216-050-00	RES,CHIP	1.1K	5%	1/10W
R523	1-216-079-00	METAL CHIP	18K	5%	1/10W
R524	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R525	1-216-076-00	METAL CHIP	13K	5%	1/10W
R531	1-216-073-00	METAL CHIP	10K	5%	1/10W
R532	1-216-050-00	RES,CHIP	1.1K	5%	1/10W
R533	1-216-079-00	METAL CHIP	18K	5%	1/10W
R534	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R535	1-216-073-00	METAL CHIP	10K	5%	1/10W
R541	1-216-081-00	METAL CHIP	22K	5%	1/10W
R551	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R561	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R562	1-216-109-00	METAL CHIP	330K	5%	1/10W
R563	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R564	1-216-041-00	METAL CHIP	470	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R565	1-216-099-00	METAL CHIP	120K	5%	1/10W
R566	1-216-099-00	METAL CHIP	120K	5%	1/10W
R567	1-216-295-00	METAL CHIP	0	5%	1/10W
R571	1-216-077-00	METAL CHIP	15K	5%	1/10W
R572	1-216-095-00	METAL CHIP	82K	5%	1/10W
R573	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R574	1-216-073-00	METAL CHIP	10K	5%	1/10W
R575	1-216-295-00	METAL CHIP	0	5%	1/10W
R591	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R592	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R602	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R603	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R604	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R605	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R606	1-216-049-00	METAL CHIP	1K	5%	1/10W
R607	1-216-049-00	METAL CHIP	1K	5%	1/10W
R701	1-216-025-91	RES,CHIP	100	5%	1/10W
R802	1-216-121-91	RES,CHIP	1M	5%	1/10W
R803	1-216-081-00	METAL CHIP	22K	5%	1/10W
R804	1-216-099-00	METAL CHIP	120K	5%	1/10W
R805	1-216-083-00	METAL CHIP	27K	5%	1/10W
R806	1-216-047-91	RES,CHIP	820	5%	1/10W
R807	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R808	1-216-099-00	METAL CHIP	120K	5%	1/10W
R809	1-216-083-00	METAL CHIP	27K	5%	1/10W
R810	1-216-121-91	RES,CHIP	1M	5%	1/10W
R811	1-216-081-00	METAL CHIP	22K	5%	1/10W
R813	1-216-097-91	RES,CHIP	100K	5%	1/10W
R814	1-249-424-11	CARBON	3.9K	5%	1/4W F
R815	1-216-295-00	METAL CHIP	0	5%	1/10W
R816	1-216-073-00	METAL CHIP	10K	5%	1/10W
R817	1-216-081-00	METAL CHIP	22K	5%	1/10W
R818	1-216-049-00	METAL CHIP	1K	5%	1/10W
R819	1-216-295-00	METAL CHIP	0	5%	1/10W
R820	1-216-073-00	METAL CHIP	10K	5%	1/10W
R821	1-216-081-00	METAL CHIP	22K	5%	1/10W
R822	1-216-295-00	METAL CHIP	0	5%	1/10W
R823	1-216-081-00	METAL CHIP	22K	5%	1/10W
R868	1-216-035-00	METAL CHIP	270	5%	1/10W
R869	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R870	1-216-089-00	METAL CHIP	47K	5%	1/10W
R871	1-216-212-00	RES,CHIP	3.9K	5%	1/8W
R872	1-216-212-00	RES,CHIP	3.9K	5%	1/8W
R873	1-216-073-00	METAL CHIP	10K	5%	1/10W
R874	1-216-073-00	METAL CHIP	10K	5%	1/10W
R875	1-216-049-00	METAL CHIP	1K	5%	1/10W
R876	1-216-073-00	METAL CHIP	10K	5%	1/10W
R877	1-216-049-00	METAL CHIP	1K	5%	1/10W
R878	1-216-073-00	METAL CHIP	10K	5%	1/10W
R879	1-216-073-00	METAL CHIP	10K	5%	1/10W
R880	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R881	1-216-081-00	METAL CHIP	22K	5%	1/10W
⚠R882	1-249-395-11	CARBON	15	5%	1/4W F
R883	1-216-073-00	METAL CHIP	10K	5%	1/10W
R885	1-216-073-00	METAL CHIP	10K	5%	1/10W
R886	1-216-073-00	METAL CHIP	10K	5%	1/10W
R887	1-216-089-00	METAL CHIP	47K	5%	1/10W
R889	1-216-073-00	METAL CHIP	10K	5%	1/10W
R890	1-216-085-00	METAL CHIP	33K	5%	1/10W
R891	1-216-083-00	METAL CHIP	27K	5%	1/10W
⚠R892	1-249-394-11	CARBON	12	5%	1/4W F
R893	1-216-089-00	METAL CHIP	47K	5%	1/10W
R895	1-216-105-91	RES,CHIP	220K	5%	1/10W
R896	1-216-105-91	RES,CHIP	220K	5%	1/10W
R901	1-216-073-00	METAL CHIP	10K	5%	1/10W
R902	1-216-049-00	METAL CHIP	1K	5%	1/10W
R903	1-216-049-00	METAL CHIP	1K	5%	1/10W
R905	1-216-049-00	METAL CHIP	1K	5%	1/10W
R906	1-216-049-00	METAL CHIP	1K	5%	1/10W
R907	1-216-049-00	METAL CHIP	1K	5%	1/10W
		< VARIABLE RESISTOR >			
RV201	1-238-019-11	RES, ADJ, CARBON 47K			
RV202	1-238-019-11	RES, ADJ, CARBON 47K			
RV521	1-241-763-11	RES, ADJ, CERMET 4.7K			
RV522	1-241-885-11	RES, ADJ, CERMET 470K			
RV531	1-241-763-11	RES, ADJ, CERMET 4.7K			
RV532	1-241-885-11	RES, ADJ, CERMET 470K			
RV541	1-241-764-11	RES, ADJ, CERMET 10K			
		< SWITCH >			
S251	1-570-953-11	SWITCH, PUSH (1 KEY)(REC PROOF)			
S901	1-762-207-11	SWITCH, SLIDE (NTSC PB)			
		< TRANSFORMER >			
T881	1-423-413-11	TRANSFORMER, BIAS OSCILLATION			
T891	1-423-415-11	TRANSFORMER, BIAS OSCILLATION			
		< THERMISTOR >			
TH592	1-202-854-00	THERMISTOR, POSITIVE			
		< VIBRATOR >			
X201	1-760-494-11	VIBRATOR, CRYSTAL 16MHz			
X301	1-579-608-11	VIBRATOR, CRYSTAL 4.43MHz			
X302	1-577-380-11	VIBRATOR, CRYSTAL 3.58MHz			
X401	1-577-289-11	VIBRATOR, CRYSTAL 17.73MHz			
*	A-6794-350-A	MB-77 BOARD, COMPLETE			
		**********			
		(Ref.No.5,000 series)			
		< CAPACITOR >			
C500	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C501	1-104-664-11	ELECT	47uF	20%	25V
C502	1-104-664-11	ELECT	47uF	20%	25V
C503	1-104-664-11	ELECT	47uF	20%	25V
C504	1-137-372-11	FILM	0.022uF	5%	50V
C505	1-126-964-11	ELECT	10uF	20%	50V
C506	1-104-664-11	ELECT	47uF	20%	25V
C507	1-126-964-11	ELECT	10uF	20%	50V
C508	1-137-368-11	FILM	0.0047uF	5%	50V
C509	1-104-664-11	ELECT	47uF	20%	25V

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
C510	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C511	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C512	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C513	1-104-664-11	ELECT	47uF	20%	25V
C514	1-126-964-11	ELECT	10uF	20%	50V
C515	1-104-664-11	ELECT	47uF	20%	25V
C517	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C518	1-137-372-11	FILM	0.022uF	5%	50V
C520	1-126-960-11	ELECT	1uF	20%	50V
C521	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C522	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C523	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C524	1-104-664-11	ELECT	47uF	20%	25V
C525	1-104-664-11	ELECT	47uF	20%	25V
C526	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C527	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C528	1-104-664-11	ELECT	47uF	20%	25V
C529	1-104-664-11	ELECT	47uF	20%	25V
C530	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C531	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C532	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C533	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C534	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C535	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C536	1-104-664-11	ELECT	47uF	20%	25V
C537	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C538	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C539	1-163-014-00	CERAMIC CHIP	0.0027uF	5%	50V
C540	1-163-014-00	CERAMIC CHIP	0.0027uF	5%	50V
C541	1-107-714-11	ELECT	10uF	20%	16V
C542	1-107-714-11	ELECT	10uF	20%	16V
C543	1-104-664-11	ELECT	47uF	20%	25V
C544	1-126-960-11	ELECT	1uF	20%	50V
C546	1-163-014-00	CERAMIC CHIP	0.0027uF	5%	50V
C547	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C548	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C560	1-126-960-11	ELECT	1uF	20%	50V
C561	1-126-960-11	ELECT	1uF	20%	50V
C562	1-130-495-00	MYLAR	0.1uF	5%	50V
C563	1-130-495-00	MYLAR	0.1uF	5%	50V
C564	1-137-372-11	FILM	0.022uF	5%	50V
C565	1-137-372-11	FILM	0.022uF	5%	50V
C566	1-126-964-11	ELECT	10uF	20%	50V
C567	1-126-964-11	ELECT	10uF	20%	50V
C568	1-126-964-11	ELECT	10uF	20%	50V
C569	1-137-366-11	FILM	0.0022uF	5%	50V
C570	1-137-370-11	FILM	0.01uF	5%	50V
C571	1-126-964-11	ELECT	10uF	20%	50V
C572	1-126-964-11	ELECT	10uF	20%	50V
C573	1-126-964-11	ELECT	10uF	20%	50V
C574	1-126-964-11	ELECT	10uF	20%	50V
C575	1-163-014-00	CERAMIC CHIP	0.0027uF	5%	50V
C580	1-107-714-11	ELECT	10uF	20%	16V
C581	1-107-714-11	ELECT	10uF	20%	16V
C582	1-104-664-11	ELECT	47uF	20%	25V

Ref. No.	Part No.	Description			Remarks
C583	1-104-664-11	ELECT	47uF	20%	25V
C590	1-126-935-11	ELECT	470uF	20%	16V
C591	1-104-664-11	ELECT	47uF	20%	25V
C592	1-104-664-11	ELECT	47uF	20%	25V
C593	1-126-960-11	ELECT	1uF	20%	50V
C594	1-126-935-11	ELECT	470uF	20%	16V
C600	1-126-952-11	ELECT	1000uF	20%	35V
C601	1-126-967-11	ELECT	47uF	20%	50V
C602	1-126-964-11	ELECT	10uF	20%	50V
C603	1-126-949-11	ELECT	220uF	20%	35V
C604	1-126-964-11	ELECT	10uF	20%	50V
C605	1-126-967-11	ELECT	47uF	20%	50V
C606	1-126-949-11	ELECT	220uF	20%	35V
C607	1-126-964-11	ELECT	10uF	20%	50V
C608	1-126-964-11	ELECT	10uF	20%	50V
C609	1-126-964-11	ELECT	10uF	20%	50V
C610	1-126-967-11	ELECT	47uF	20%	50V
C611	1-137-368-11	FILM	0.0047uF	5%	50V
C612	1-137-368-11	FILM	0.0047uF	5%	50V
C613	1-137-368-11	FILM	0.0047uF	5%	50V
C614	1-126-967-11	ELECT	47uF	20%	50V
C615	1-137-368-11	FILM	0.0047uF	5%	50V
C616	1-137-368-11	FILM	0.0047uF	5%	50V
C617	1-126-960-11	ELECT	1uF	20%	50V
C618	1-137-366-11	FILM	0.0022uF	5%	50V
C619	1-137-366-11	FILM	0.0022uF	5%	50V
C620	1-137-368-11	FILM	0.0047uF	5%	50V
C621	1-137-368-11	FILM	0.0047uF	5%	50V
C622	1-137-368-11	FILM	0.0047uF	5%	50V
C623	1-137-368-11	FILM	0.0047uF	5%	50V
C624	1-126-967-11	ELECT	47uF	20%	50V
C625	1-137-368-11	FILM	0.0047uF	5%	50V
C626	1-126-967-11	ELECT	47uF	20%	50V
C627	1-126-967-11	ELECT	47uF	20%	50V
C628	1-126-950-11	ELECT	330uF	20%	35V
C629	1-126-952-11	ELECT	1000uF	20%	35V
C630	1-104-664-11	ELECT	47uF	20%	25V
C631	1-104-664-11	ELECT	47uF	20%	25V
C640	1-126-967-11	ELECT	47uF	20%	50V
C641	1-126-967-11	ELECT	47uF	20%	50V
C642	1-126-967-11	ELECT	47uF	20%	50V
C643	1-104-664-11	ELECT	47uF	20%	25V
C660	1-126-935-11	ELECT	470uF	20%	16V
C661	1-104-664-11	ELECT	47uF	20%	25V
C662	1-104-664-11	ELECT	47uF	20%	25V
C663	1-107-714-11	ELECT	10uF	20%	16V
C666	1-107-714-11	ELECT	10uF	20%	16V
C667	1-126-964-11	ELECT	10uF	20%	50V
C700	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C701	1-104-664-11	ELECT	47uF	20%	25V
C702	1-104-664-11	ELECT	47uF	20%	25V
C703	1-126-950-11	ELECT	330uF	20%	35V
C704	1-126-950-11	ELECT	330uF	20%	35V
C705	1-104-664-11	ELECT	47uF	20%	25V
C706	1-104-664-11	ELECT	47uF	20%	25V

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Ref. No.	Part No.	Description			Remarks
C751	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C752	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C753	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C754	1-104-664-11	ELECT	47uF	20%	25V
C755	1-126-925-11	ELECT	470uF	20%	10V
C756	1-126-925-11	ELECT	470uF	20%	10V
C757	1-126-925-11	ELECT	470uF	20%	10V
C758	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C759	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C760	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C761	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C762	1-104-664-11	ELECT	47uF	20%	25V
		< CONNECTOR >			
CN601	1-506-474-11	PIN, CONNECTOR 9P			
CN602	1-691-055-21	HOUSING, CONNECTOR 23P			
CN603	1-506-473-11	PIN, CONNECTOR 8P			
CN604	1-506-475-11	PIN, CONNECTOR 10P			
CN605	1-770-064-11	CONNECTOR, FFC/FPC 29P			
		< DIODE >			
D501	8-719-988-62	DIODE 1SS355			
D502	8-719-988-62	DIODE 1SS355			
D660	8-719-200-82	DIODE 11ES2			
D661	8-719-988-62	DIODE 1SS355			
D701	8-719-975-40	DIODE RB411D			
		< FERRITE BEAD >			
FB501	1-414-234-22	INDUCTOR CHIP 0UH			
FB502	1-414-234-22	INDUCTOR CHIP 0UH			
		< IC >			
IC500	8-759-240-03	IC TC74HCT32AF			
IC501	8-752-377-43	IC CXD2720Q			
IC502	8-759-099-06	IC M5218AFP-TE1			
IC503	8-759-099-06	IC M5218AFP-TE1			
IC504	8-759-099-06	IC M5218AFP-TE1			
IC505	8-759-099-06	IC M5218AFP-TE1			
IC506	8-752-068-78	IC CXA1842S			
IC507	8-759-099-06	IC M5218AFP-TE1			
⚠IC508	8-759-604-35	IC M5F78M05L			
IC509	8-759-185-27	IC PCM1710U-A			
IC510	8-759-099-06	IC M5218AFP-TE1			
IC511	8-759-099-06	IC M5218AFP-TE1			
IC512	8-759-099-06	IC M5218AFP-TE1			
⚠IC513	8-759-701-59	IC NJM78M09FA			
⚠IC514	8-759-604-42	IC M5F79M08L			
IC515	8-759-009-05	IC MC14051BF			
IC516	8-759-009-05	IC MC14051BF			
IC517	8-759-099-06	IC M5218AFP-TE1			
IC518	8-759-099-06	IC M5218AFP-TE1			
IC519	8-759-099-06	IC M5218AFP-TE1			
IC520	8-759-009-06	IC MC14052BF			
IC521	8-759-099-06	IC M5218AFP-TE1			
⚠IC701	8-759-604-86	IC M5F7807L			
⚠IC702	8-759-822-99	IC L88MS05T-FA			
⚠IC703	8-759-701-59	IC NJM78M09FA			

Ref. No.	Part No.	Description	Remarks
⚠IC704	8-759-604-42	IC M5F79M08L	
IC705	8-759-166-03	IC M50253PK	
IC751	8-759-295-66	IC BA7653AF-E2	
		< JACK >	
J601	1-565-351-41	JACK, PIN 3P (LINE-1 IN)	
J602	1-764-222-11	JACK, PIN 6P (LINE-1 OUT,VIDEO CD DIRECT OUT)	
		< JUMPER >	
JS605	1-216-295-91	SHORT 0	
		< COIL >	
L503	1-412-947-11	INDUCTOR 4.7uH	
		< PIN >	
LP601	4-352-844-01	PIN, LEAD, COATING	
		< TRANSISTOR >	
Q520	8-729-115-30	TRANSISTOR 2SK105A-30	
Q521	8-729-901-06	TRANSISTOR DTA144EK	
Q590	8-729-421-19	TRANSISTOR UN2213	
Q600	8-729-010-29	TRANSISTOR MSD601-RST1	
Q630	8-729-115-30	TRANSISTOR 2SK105A-30	
Q631	8-729-901-06	TRANSISTOR DTA144EK	
Q660	8-729-010-05	TRANSISTOR MSB709-RT1	
Q661	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q662	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q663	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q664	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q665	8-729-421-19	TRANSISTOR UN2213	
Q690	8-729-010-05	TRANSISTOR MSB709-RT1	
Q751	8-729-010-29	TRANSISTOR MSD601-RST1	
Q752	8-729-010-29	TRANSISTOR MSD601-RST1	
Q753	8-729-010-29	TRANSISTOR MSD601-RST1	
Q754	8-729-010-29	TRANSISTOR MSD601-RST1	
Q755	8-729-010-29	TRANSISTOR MSD601-RST1	
Q756	8-729-010-29	TRANSISTOR MSD601-RST1	
		< RESISTOR >	
R500	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R501	1-216-033-00	METAL CHIP 220 5% 1/10W	
R502	1-216-033-00	METAL CHIP 220 5% 1/10W	
R503	1-216-041-00	METAL CHIP 470 5% 1/10W	
R504	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R505	1-216-041-00	METAL CHIP 470 5% 1/10W	
R506	1-216-121-91	RES,CHIP 1M 5% 1/10W	
R507	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R508	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R509	1-216-121-91	RES,CHIP 1M 5% 1/10W	
R510	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R511	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R512	1-216-121-91	RES,CHIP 1M 5% 1/10W	
R513	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R514	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
R515	1-216-041-00	METAL CHIP	470	5%	1/10W
R516	1-216-041-00	METAL CHIP	470	5%	1/10W
R517	1-216-041-00	METAL CHIP	470	5%	1/10W
R518	1-216-073-00	METAL CHIP	10K	5%	1/10W
R519	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R520	1-216-113-00	METAL CHIP	470K	5%	1/10W
R521	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R522	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R523	1-216-085-00	METAL CHIP	33K	5%	1/10W
R524	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R525	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R526	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R527	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R528	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R529	1-216-085-00	METAL CHIP	33K	5%	1/10W
R530	1-216-085-00	METAL CHIP	33K	5%	1/10W
R531	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R532	1-216-113-00	METAL CHIP	470K	5%	1/10W
R533	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R534	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R535	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R536	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R537	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R538	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R539	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R540	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R541	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R542	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R543	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R544	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R545	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R546	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R547	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R548	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R549	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R550	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R551	1-216-041-00	METAL CHIP	470	5%	1/10W
R552	1-216-041-00	METAL CHIP	470	5%	1/10W
R553	1-216-041-00	METAL CHIP	470	5%	1/10W
R554	1-216-025-91	RES,CHIP	100	5%	1/10W
R555	1-216-025-91	RES,CHIP	100	5%	1/10W
R556	1-216-025-91	RES,CHIP	100	5%	1/10W
R557	1-216-295-91	SHORT	0		
R558	1-216-295-91	SHORT	0		
R560	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R561	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R562	1-216-043-91	RES,CHIP	560	5%	1/10W
R563	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R564	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R565	1-216-043-91	RES,CHIP	560	5%	1/10W
R566	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R567	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R568	1-216-049-91	RES,CHIP	1K	5%	1/10W
R569	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R570	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R571	1-216-049-91	RES,CHIP	1K	5%	1/10W
R572	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R573	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R580	1-216-089-91	RES,CHIP	47K	5%	1/10W
R581	1-216-089-91	RES,CHIP	47K	5%	1/10W
R582	1-216-089-91	RES,CHIP	47K	5%	1/10W
R583	1-216-089-91	RES,CHIP	47K	5%	1/10W
R584	1-216-041-00	METAL CHIP	470	5%	1/10W
R585	1-216-041-00	METAL CHIP	470	5%	1/10W
R586	1-216-041-00	METAL CHIP	470	5%	1/10W
R587	1-216-041-00	METAL CHIP	470	5%	1/10W
R590	1-216-049-91	RES,CHIP	1K	5%	1/10W
R600	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R601	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R602	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R603	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R604	1-249-418-11	CARBON	1.2K	5%	1/4W F
R605	1-249-418-11	CARBON	1.2K	5%	1/4W F
R606	1-249-418-11	CARBON	1.2K	5%	1/4W F
R607	1-249-418-11	CARBON	1.2K	5%	1/4W F
R608	1-249-421-11	CARBON	2.2K	5%	1/4W F
R609	1-249-421-11	CARBON	2.2K	5%	1/4W F
R610	1-249-420-11	CARBON	1.8K	5%	1/4W F
R611	1-249-420-11	CARBON	1.8K	5%	1/4W F
R612	1-216-073-00	METAL CHIP	10K	5%	1/10W
R613	1-216-073-00	METAL CHIP	10K	5%	1/10W
R614	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R615	1-249-419-11	CARBON	1.5K	5%	1/4W F
R616	1-249-419-11	CARBON	1.5K	5%	1/4W F
R617	1-249-419-11	CARBON	1.5K	5%	1/4W F
R618	1-249-419-11	CARBON	1.5K	5%	1/4W F
R619	1-216-081-00	METAL CHIP	22K	5%	1/10W
R620	1-216-081-00	METAL CHIP	22K	5%	1/10W
R621	1-216-073-00	METAL CHIP	10K	5%	1/10W
R623	1-216-295-91	SHORT	0		
R624	1-216-295-91	SHORT	0		
R625	1-216-295-91	SHORT	0		
R630	1-216-085-00	METAL CHIP	33K	5%	1/10W
R631	1-216-085-00	METAL CHIP	33K	5%	1/10W
R632	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R633	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R640	1-216-073-00	METAL CHIP	10K	5%	1/10W
R641	1-216-073-00	METAL CHIP	10K	5%	1/10W
R642	1-216-073-00	METAL CHIP	10K	5%	1/10W
R643	1-216-073-00	METAL CHIP	10K	5%	1/10W
R644	1-216-089-91	RES,CHIP	47K	5%	1/10W
R645	1-216-089-91	RES,CHIP	47K	5%	1/10W
R646	1-216-089-91	RES,CHIP	47K	5%	1/10W
R647	1-216-089-91	RES,CHIP	47K	5%	1/10W
R648	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R649	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R650	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R651	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R660	1-216-049-91	RES,CHIP	1K	5%	1/10W
R661	1-216-295-91	SHORT	0		

Ref. No.	Part No.	Description			Remarks
R664	1-216-097-91	RES,CHIP	100K	5%	1/10W
R665	1-216-089-91	RES,CHIP	47K	5%	1/10W
R666	1-216-113-00	METAL CHIP	470K	5%	1/10W
R667	1-216-089-91	RES,CHIP	47K	5%	1/10W
R668	1-216-089-91	RES,CHIP	47K	5%	1/10W
R669	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R670	1-247-815-91	CARBON	220	5%	1/4W
R671	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R672	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R673	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R674	1-216-033-00	METAL CHIP	220	5%	1/10W
R675	1-216-089-91	RES,CHIP	47K	5%	1/10W
R677	1-247-815-91	CARBON	220	5%	1/4W
R678	1-216-033-00	METAL CHIP	220	5%	1/10W
R680	1-216-089-91	RES,CHIP	47K	5%	1/10W
R681	1-216-033-00	METAL CHIP	220	5%	1/10W
R682	1-247-815-91	CARBON	220	5%	1/4W
R683	1-216-033-00	METAL CHIP	220	5%	1/10W
R684	1-247-815-91	CARBON	220	5%	1/4W
R685	1-216-021-00	METAL CHIP	68	5%	1/10W
R686	1-216-022-00	METAL CHIP	75	5%	1/10W
R688	1-216-022-00	METAL CHIP	75	5%	1/10W
R689	1-216-105-91	RES,CHIP	220K	5%	1/10W
R690	1-216-097-91	RES,CHIP	100K	5%	1/10W
R691	1-216-049-91	RES,CHIP	1K	5%	1/10W
R692	1-216-113-00	METAL CHIP	470K	5%	1/10W
R693	1-216-097-91	RES,CHIP	100K	5%	1/10W
R694	1-216-097-91	RES,CHIP	100K	5%	1/10W
R700	1-216-073-00	METAL CHIP	10K	5%	1/10W
R701	1-216-073-00	METAL CHIP	10K	5%	1/10W
R702	1-216-113-00	METAL CHIP	470K	5%	1/10W
R703	1-216-113-00	METAL CHIP	470K	5%	1/10W
R704	1-216-073-00	METAL CHIP	10K	5%	1/10W
R705	1-216-073-00	METAL CHIP	10K	5%	1/10W
R706	1-216-033-00	METAL CHIP	220	5%	1/10W
R751	1-216-025-91	RES,CHIP	100	5%	1/10W
R752	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R753	1-216-025-91	RES,CHIP	100	5%	1/10W
R754	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R755	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R756	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R757	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R758	1-216-295-91	SHORT	0		
R759	1-216-025-91	RES,CHIP	100	5%	1/10W
R760	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R761	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R762	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R763	1-216-025-91	RES,CHIP	100	5%	1/10W
R764	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R765	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R766	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R767	1-216-025-91	RES,CHIP	100	5%	1/10W
R768	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R769	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R770	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
		< VIBRATOR >			
X502	1-579-833-21	VIBRATOR, CRYSTAL 33.868MHz			

Ref. No.	Part No.	Description			Remarks
*	A-6794-578-A	MJ-92 BOARD, COMPLETE			
		**********			
					(Ref.No.4,000 series)
		< CAPACITOR >			
C601	1-124-234-00	ELECT	22uF	20%	16V
C602	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C604	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C605	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C606	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C607	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C608	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C609	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C610	1-124-234-00	ELECT	22uF	20%	16V
C611	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
		< CONNECTOR >			
CN601	1-568-852-11	CONNECTOR, FFC/FPC 9P			
CN602	1-506-473-11	PIN, CONNECTOR 8P			
		< DIODE >			
D601	8-719-108-12	DIODE RD9.1E-W			
		< IC >			
IC601	8-759-099-06	IC M5218AFP-TE1			
		< JACK >			
J601	1-750-781-11	JACK, LARGE TYPE (MIC IN 1)			
J602	1-750-781-11	JACK, LARGE TYPE (MIC IN 2)			
J603	1-507-678-00	JACK (CONTROL)			
		< JUMPER RESISTOR >			
JR601	1-216-295-00	METAL CHIP	0	5%	1/10W
JR602	1-216-296-00	METAL CHIP	0	5%	1/8W
JS602	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L601	1-412-955-11	INDUCTOR	22uH		
		< RESISTOR >			
R601	1-216-089-00	METAL CHIP	47K	5%	1/10W
R602	1-216-049-00	METAL CHIP	1K	5%	1/10W
R603	1-216-045-00	METAL CHIP	680	5%	1/10W
R604	1-216-073-00	METAL CHIP	10K	5%	1/10W
R605	1-216-295-00	METAL CHIP	0	5%	1/10W
R606	1-216-295-00	METAL CHIP	0	5%	1/10W
R607	1-216-073-00	METAL CHIP	10K	5%	1/10W
R608	1-216-049-00	METAL CHIP	1K	5%	1/10W
R609	1-216-045-00	METAL CHIP	680	5%	1/10W
R610	1-216-089-00	METAL CHIP	47K	5%	1/10W
*	A-6794-579-A	PS-418 BOARD, COMPLETE			
		**********			
					(Ref.No.6,000 series)
*	3-951-893-01	HEAT SINK			
	4-352-844-01	PIN, LEAD, COATING			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3			

Ref. No.	Part No.	Description			Remarks
		< CAPACITOR >			
⚠C101	1-104-705-11	FILM	0.1uF	20%	250V
⚠C102	1-104-705-11	FILM	0.1uF	20%	250V
⚠C103	1-107-414-11	ELECT(BLOCK)	220uF	20%	400V
⚠C104	1-113-898-11	CERAMIC	330PF	10%	250V
⚠C105	1-113-898-11	CERAMIC	330PF	10%	250V
C107	1-113-898-11	CERAMIC	330PF	10%	250V
C121	1-126-767-11	ELECT	1000uF	20%	16V
C122	1-126-926-11	ELECT	1000uF	20%	10V
C123	1-126-767-11	ELECT	1000uF	20%	16V
C124	1-126-767-11	ELECT	1000uF	20%	16V
C131	1-126-935-11	ELECT	470uF	20%	16V
C135	1-126-935-11	ELECT	470uF	20%	16V
C137	1-104-660-11	ELECT	47uF	20%	16V
C141	1-126-933-11	ELECT	100uF	20%	16V
C151	1-126-916-11	ELECT	1000uF	20%	6.3V
C161	1-104-660-11	ELECT	47uF	20%	16V
C162	1-126-916-11	ELECT	1000uF	20%	6.3V
C171	1-126-935-11	ELECT	470uF	20%	16V
C181	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C182	1-104-660-11	ELECT	47uF	20%	16V
C185	1-104-660-11	ELECT	47uF	20%	16V
C186	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C187	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C188	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C189	1-126-967-11	ELECT	47uF	20%	50V
C190	1-126-967-11	ELECT	47uF	20%	50V
		< INLET >			
⚠CJ101	1-251-134-11	INLET, AC (NONPOLAR)(AC IN ~)			
		< CONNECTOR >			
CN101	1-573-131-11	PIN, CONNECTOR 8P			
CN102	1-573-132-31	PIN, CONNECTOR 9P			
CN103	1-573-132-21	PIN, CONNECTOR 9P			
* CN104	1-564-005-11	PIN, CONNECTOR 6P			
		< CONPOSITION CIRCUIT BLOCK >			
⚠CP101	1-468-171-11	POWER BLOCK			
CP181	1-473-301-11	CONVERTER UNIT, DC/DC			
		< DIODE >			
⚠D101	8-719-510-06	DIODE S1WB60			
⚠D161	8-719-991-33	DIODE 1SS133T-77			
⚠D162	8-719-109-86	DIODE RD5.1ES-B3			
		< FUSE >			
⚠F101	1-532-388-31	FUSE 2A 250V			
		< HOLDER >			
FH101	1-533-399-31	HOLDER, FUSE			
FH102	1-533-399-31	HOLDER, FUSE			

Ref. No.	Part No.	Description				Remarks
		< IC >				
⚠IC141	8-759-189-48	IC PQ12RE11				
		< COIL >				
⚠L121	1-403-588-11	INDUCTOR	22uH			
⚠L122	1-403-588-11	INDUCTOR	22uH			
⚠L123	1-403-588-11	INDUCTOR	22uH			
⚠L124	1-403-588-11	INDUCTOR	22uH			
⚠L151	1-403-588-11	INDUCTOR	22uH			
⚠L171	1-403-588-11	INDUCTOR	22uH			
L181	1-408-970-21	INDUCTOR	10uH			
L182	1-410-501-11	INDUCTOR	2.2uH			
L183	1-410-501-11	INDUCTOR	2.2uH			
L190	1-410-517-11	INDUCTOR	47uH			
⚠L191	1-403-588-11	INDUCTOR	22uH			
		< LINE FILTER >				
⚠LF102	1-424-117-11	FILTER, LINE				
⚠LF103	1-424-117-11	FILTER, LINE				
		< IC LINK >				
⚠PS121	1-532-605-00	LINK, IC	0.4A			
⚠PS131	1-532-637-00	LINK, IC	1.0A			
⚠PS151	1-532-637-00	LINK, IC	1.0A			
⚠PS161	1-532-637-00	LINK, IC	1.0A			
⚠PS181	1-532-605-00	LINK, IC	0.4A			
		< TRANSISTOR >				
⚠Q135	8-729-140-93	TRANSISTOR	2SB733-34			
Q136	8-729-421-22	TRANSISTOR	UN2211			
⚠Q161	8-729-140-98	TRANSISTOR	2SD773-34			
⚠Q171	8-729-140-93	TRANSISTOR	2SB733-34			
Q172	8-729-421-22	TRANSISTOR	UN2211			
Q173	8-729-010-05	TRANSISTOR	MSB709-RT1			
⚠Q191	8-729-801-93	TRANSISTOR	2SD1387			
Q192	8-729-901-06	TRANSISTOR	DTA144EK			
Q193	8-729-421-19	TRANSISTOR	UN2213			
		< RESISTOR >				
⚠R101	1-214-947-00	METAL	2.7M	1%	1/2W	
R135	1-247-831-91	CARBON	1K	5%	1/4W	F
⚠R136	1-216-430-11	METAL OXIDE	390	5%	1W	F
R137	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R142	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R161	1-247-821-11	CARBON	390	5%	1/4W	F
R171	1-247-831-91	CARBON	1K	5%	1/4W	F
⚠R172	1-216-430-11	METAL OXIDE	390	5%	1W	F
R173	1-216-049-00	METAL CHIP	1K	5%	1/10W	
⚠R174	1-216-351-00	METAL OXIDE	1.5	5%	1W	F
R191	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R192	1-216-077-00	METAL CHIP	15K	5%	1/10W	
		< VARISTOR >				
VDR101	1-809-267-41	VARISTOR ERZV10D471				

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

RP-233

Ref. No.	Part No.	Description			Remarks
*	A-6791-684-A	RP-233 BOARD, COMPLETE			
		**********			
					(Ref.No.2,000 series)
		< CAPACITOR >			
C503	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C504	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C505	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C506	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C507	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C508	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C509	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C510	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C511	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C512	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C513	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C514	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C515	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C516	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C517	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C518	1-124-584-00	ELECT	100uF	20%	10V
C519	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C520	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C521	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C522	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C523	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C524	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C525	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C526	1-124-584-00	ELECT	100uF	20%	10V
C527	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C528	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C529	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C531	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C532	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C760	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C761	1-124-584-00	ELECT	100uF	20%	10V
C762	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C763	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C764	1-124-257-00	ELECT	2.2uF	20%	50V
C765	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C767	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C768	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C769	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C770	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C773	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C774	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C775	1-126-160-11	ELECT	1uF	20%	50V
C776	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C901	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C902	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C903	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C904	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C905	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C906	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C907	1-124-584-00	ELECT	100uF	20%	10V
C912	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C915	1-163-235-11	CERAMIC CHIP	22PF	5%	50V

Ref. No.	Part No.	Description			Remarks
		< CONNECTOR >			
CN501	1-766-986-11	CONNECTOR, FFC/FPC 13P			
* CN502	1-564-029-00	PIN, CONNECTOR 4P			
CN503	1-573-829-11	CONNECTOR, BOARD TO BOARD 15P			
CN701	1-766-724-11	CONNECTOR, BOARD TO BOARD 7P			
		< IC >			
IC501	8-759-352-17	IC HA118195NT			
IC760	8-759-055-49	IC AN3327K			
		< JUMPER RESISTOR >			
JR502	1-216-295-00	METAL CHIP	0	5%	1/10W
JR503	1-216-295-00	METAL CHIP	0	5%	1/10W
JR504	1-216-295-00	METAL CHIP	0	5%	1/10W
JR507	1-216-295-00	METAL CHIP	0	5%	1/10W
JR508	1-216-295-00	METAL CHIP	0	5%	1/10W
JR509	1-216-295-00	METAL CHIP	0	5%	1/10W
JS901	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L501	1-408-982-11	INDUCTOR	100uH		
L502	1-408-982-11	INDUCTOR	100uH		
L503	1-408-948-00	INDUCTOR	220uH		
L760	1-408-982-11	INDUCTOR	100uH		
L901	1-408-982-11	INDUCTOR	100uH		
L903	1-408-976-21	INDUCTOR	33uH		
L904	1-408-972-21	INDUCTOR	15uH		
L905	1-408-972-21	INDUCTOR	15uH		
L906	1-408-978-21	INDUCTOR	47uH		
		< TRANSISTOR >			
Q501	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q502	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q901	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q902	8-729-421-19	TRANSISTOR	UN2213		
Q904	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q905	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q906	8-729-421-19	TRANSISTOR	UN2213		
Q931	8-729-901-06	TRANSISTOR	DTA144EK		
		< RESISTOR >			
R501	1-216-033-00	METAL CHIP	220	5%	1/10W
R502	1-216-033-00	METAL CHIP	220	5%	1/10W
R503	1-216-295-00	METAL CHIP	0	5%	1/10W
R503	8-729-421-19	TRANSISTOR MUN	2213T1		
R504	1-216-295-00	METAL CHIP	0	5%	1/10W
R504	8-729-901-06	TRANSISTOR MUN	2113T1		
R505	1-216-295-00	METAL CHIP	0	5%	1/10W
R506	1-216-295-00	METAL CHIP	0	5%	1/10W
R507	1-216-657-11	METAL CHIP	1.8K	0.5%	1/10W
R508	1-216-073-00	METAL CHIP	10K	5%	1/10W
R509	1-216-295-00	METAL CHIP	0	5%	1/10W
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W
R511	1-216-081-00	METAL CHIP	22K	5%	1/10W
R512	1-216-296-00	METAL CHIP	0	5%	1/8W
R513	1-216-081-00	METAL CHIP	22K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R514	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R515	1-216-081-00	METAL CHIP	22K	5%	1/10W
R516	1-216-049-00	METAL CHIP	1K	5%	1/10W
R517	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R518	1-216-049-00	METAL CHIP	1K	5%	1/10W
R519	1-216-049-00	METAL CHIP	1K	5%	1/10W
R520	1-216-049-00	METAL CHIP	1K	5%	1/10W
R521	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R762	1-216-035-00	METAL CHIP	270	5%	1/10W
R763	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R765	1-216-033-00	METAL CHIP	220	5%	1/10W
R766	1-249-418-11	CARBON	1.2K	5%	1/4W F
R767	1-216-035-00	METAL CHIP	270	5%	1/10W
R768	1-216-097-91	RES,CHIP	100K	5%	1/10W
R771	1-216-079-00	METAL CHIP	18K	5%	1/10W
R776	1-216-073-00	METAL CHIP	10K	5%	1/10W
R901	1-216-049-00	METAL CHIP	1K	5%	1/10W
R902	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R903	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R904	1-216-041-00	METAL CHIP	470	5%	1/10W
R905	1-216-045-00	METAL CHIP	680	5%	1/10W
R906	1-216-043-91	RES,CHIP	560	5%	1/10W
R907	1-216-049-00	METAL CHIP	1K	5%	1/10W
R908	1-216-047-91	RES,CHIP	820	5%	1/10W
R912	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R913	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R914	1-216-041-00	METAL CHIP	470	5%	1/10W
R916	1-216-041-00	METAL CHIP	470	5%	1/10W
R917	1-216-047-91	RES,CHIP	820	5%	1/10W
R918	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R919	1-216-041-00	METAL CHIP	470	5%	1/10W
R933	1-216-073-00	METAL CHIP	10K	5%	1/10W

*	A-6794-577-A	SW-323 BOARD, COMPLETE			
		**********			
					(Ref.No.4,000 series)
		< CAPACITOR >			
C451	1-163-035-00	CERAMIC CHIP	0.047uF		50V
		< CONNECTOR >			
CN451	1-695-368-31	CONNECTOR, FFC/FPC 7P			
		< IC >			
IC451	8-749-011-03	IC GP1U26X			
		< RESISTOR >			
R451	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R452	1-216-049-00	METAL CHIP	1K	5%	1/10W
R453	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R454	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R455	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R456	1-216-049-00	METAL CHIP	1K	5%	1/10W
R457	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R458	1-216-063-91	RES,CHIP	3.9K	5%	1/10W

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S451	1-571-977-11	SWITCH, TACTIL (REC)	
S452	1-571-977-11	SWITCH, TACTIL (STOP)	
S453	1-571-977-11	SWITCH, TACTIL (REW)	
S454	1-571-977-11	SWITCH, TACTIL (FF)	
S455	1-571-977-11	SWITCH, TACTIL (EJECT)	
S456	1-571-977-11	SWITCH, TACTIL (PLAY)	
S457	1-571-977-11	SWITCH, TACTIL (PAUSE)	

*	A-6794-574-A	TU-168 BOARD, COMPLETE				
		**********				
						(Ref.No.7,000 series)
		< CAPACITOR >				
C701	1-126-933-11	ELECT	100uF	20%	16V	
C702	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C703	1-126-964-11	ELECT	10uF	20%	50V	
C704	1-126-933-11	ELECT	100uF	20%	16V	
C705	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C706	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C707	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C709	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C710	1-126-968-11	ELECT	100uF	20%	50V	
C712	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C713	1-126-933-11	ELECT	100uF	20%	16V	
C714	1-126-933-11	ELECT	100uF	20%	16V	
C715	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C716	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C720	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C721	1-126-767-11	ELECT	1000uF	20%	16V	
C727	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C728	1-126-767-11	ELECT	1000uF	20%	16V	
C729	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C730	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C731	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C732	1-126-933-11	ELECT	100uF	20%	16V	
C733	1-126-933-11	ELECT	100uF	20%	16V	
C750	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C751	1-126-960-11	ELECT	1uF	20%	50V	
C753	1-126-933-11	ELECT	100uF	20%	16V	
C754	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C755	1-126-933-11	ELECT	100uF	20%	16V	
C756	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C757	1-137-366-11	FILM	0.0022uF	5%	50V	
C758	1-137-372-11	FILM	0.022uF	5%	50V	
C759	1-126-933-11	ELECT	100uF	20%	16V	
C780	1-216-295-91	CONDUCTOR CHIP	0			
C781	1-126-933-11	ELECT	100uF	20%	16V	
C782	1-216-295-00	CONDUCTOR CHIP	0			
C783	1-126-968-11	ELECT	100uF	20%	50V	
C784	1-126-968-11	ELECT	100uF	20%	50V	
C787	1-163-038-91	CERAMIC	0.1uF		25V	

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Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN701	1-778-991-11	CONNECTOR, FFC/FPC 21P	
* CN702	1-564-005-11	PIN, CONNECTOR 6P	
CN703	1-564-004-41	PIN, CONNECTOR 5P	
* CN704	1-564-004-11	PIN, CONNECTOR 5P	
CN705	1-564-004-31	PIN, CONNECTOR 5P	
CN780	1-785-580-11	CONNECTOR, FFC/FPC 23P	
		< DIODE >	
D701	8-719-109-84	DIODE RD5.1ES-B1	
D702	8-719-911-19	DIODE 1SS119	
D704	8-719-150-92	DIODE RD33EB3T	
D705	8-719-200-82	DIODE 11ES2	
D706	8-719-200-82	DIODE 11ES2	
D707	8-719-800-76	DIODE 1SS226	
D708	8-719-800-76	DIODE 1SS226	
D709	8-719-988-62	DIODE 1SS355	
		< FERRITE BEAD >	
FB701	1-410-397-21	FERRITE BEAD INDUCTOR	
		< IC >	
IC701	8-759-208-09	IC TC4052BFHB	
IC702	8-759-353-42	IC ST24C046	
IC703	8-759-932-69	IC BU4053BCF-T2	
IC704	8-759-295-66	IC BA7653AF-E2	
IC705	8-759-400-18	IC AN79L05	
IC706	8-759-909-71	IC BA4558F	
		< JUMPER RESISTOR >	
JR701	1-216-296-71	CONDUCTOR CHIP	1/8W
JR702	1-216-296-71	CONDUCTOR CHIP	1/8W
JR703	1-216-049-71	RES,CHIP 1.0K	
JR704	1-216-296-71	CONDUCTOR CHIP	1/8W
JR705	1-216-295-71	CONDUCTOR CHIP	1/8W
JR706	1-216-296-71	CONDUCTOR CHIP	1/8W
JR707	1-216-296-71	CONDUCTOR CHIP	1/8W
JR708	1-216-295-71	CONDUCTOR CHIP	1/8W
JR709	1-216-295-71	CONDUCTOR CHIP	1/8W
JR710	1-216-295-71	CONDUCTOR CHIP	1/8W
JR714	1-216-295-71	CONDUCTOR CHIP	1/8W
		< COIL >	
L701	1-410-501-11	INDUCTOR 2.2uH	
L703	1-410-501-11	INDUCTOR 2.2uH	
L704	1-410-501-11	INDUCTOR 2.2uH	
L706	1-410-501-11	INDUCTOR 2.2uH	
L780	1-410-501-11	INDUCTOR 2.2uH	
		< IC LINK >	
⚠PS701	1-532-605-91	LINK, IC N10	
⚠PS702	1-532-685-91	LINK, IC N20	

Ref. No.	Part No.	Description			Remarks
		< TRANSISTOR >			
Q701	8-729-106-68	TRANSISTOR 2SD1615A-GP			
Q752	8-729-421-19	TRANSISTOR UN2213			
Q753	8-729-421-19	TRANSISTOR UN2213			
Q754	8-729-421-19	TRANSISTOR UN2213			
Q755	8-729-421-19	TRANSISTOR UN2213			
Q756	8-729-010-29	TRANSISTOR MSD601-RST1			
Q757	8-729-216-22	TRANSISTOR 2SA1162-G			
		< RESISTOR >			
R701	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R702	1-216-041-00	METAL CHIP	470	5%	1/10W
R705	1-247-831-91	CARBON	1K	5%	1/4W F
⚠R707	1-212-893-00	FUSIBLE	330	5%	1/4W F
R708	1-216-113-00	METAL CHIP	470K	5%	1/10W
R710	1-216-295-00	METAL CHIP	0	5%	1/10W
R712	1-216-041-00	METAL CHIP	470	5%	1/10W
R713	1-216-041-00	METAL CHIP	470	5%	1/10W
R714	1-216-041-00	METAL CHIP	470	5%	1/10W
R717	1-216-073-00	METAL CHIP	10K	5%	1/10W
R721	1-216-041-00	METAL CHIP	470	5%	1/10W
R722	1-216-041-00	METAL CHIP	470	5%	1/10W
R727	1-216-089-00	METAL CHIP	47K	5%	1/10W
R729	1-216-049-00	METAL CHIP	1K	5%	1/10W
R730	1-216-295-00	METAL CHIP	0	5%	1/10W
R731	1-216-295-00	METAL CHIP	0	5%	1/10W
R732	1-216-073-00	METAL CHIP	10K	5%	1/10W
R733	1-216-073-00	METAL CHIP	10K	5%	1/10W
R734	1-216-073-00	METAL CHIP	10K	5%	1/10W
R780	1-247-821-81	CARBON	390		1/4W
R790	1-216-081-00	CARBON	22K		
R791	1-216-073-00	CARBON	10K	5%	1/10W
		< TUNER >			
TU701	1-693-414-11	TUNER, MOD/IF SOLID TYPE (AERIAL)			
		MISCELLANEOUS			
		**********			
65	1-782-142-11	CABLE, FLAT (FHC-1) 21P			
66	1-782-140-11	CABLE, FLAT (FHO-1) 11P			
68	1-782-141-11	CABLE, FLAT (FHA-1) 19P			
70	1-782-139-11	CABLE, FLAT (FHJ-1) 9P			
73	1-782-146-11	CABLE, FLAT (FHS-1) 7P			
103	1-782-144-11	CABLE, FLAT (FCB-1) 29P			
104	1-782-145-11	CABLE, FLAT (FAB-1) 23P			
106	1-782-143-11	CABLE, FLAT (FCD-3) 29P			
151	1-452-838-12	MAGNET (ASSY)			
201	8-848-379-31	OPTICAL PISK-UP BLOCK KSS-213B/K-N			
202	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)			
261	1-506-485-11	PIN, CONNECTOR 6P			
360	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P			
FE901	1-500-144-11	HEAD, FE			
M101	X-4917-523-4	MOTOR ASSY (SPINDLE)			

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
M102	X-4917-504-1	MOTOR ASSY (SELD)	
* M151	A-4699-134-A	MOTOR (L) ASSY	
M902	1-698-409-14	MOTOR, DC (CAPSTAN)	
M903	X-3943-883-1	MOTOR ASSY, CAM	
S901	1-762-490-11	SWITCH, ROTARY (ENCODER)	

ACCESSORIES & PACKING MATERIALS
****

	1-475-097-11	COMMANDER, STANDARD (RMT-V208)
	1-542-314-11	MICROPHONE (F-VJ5303)
	1-569-008-21	ADAPTOR, CONVERSION 2P
	1-575-334-11	CORD, CONNECTION (1.5m STEREO AV CABLE)
⚠	1-696-562-11	CORD, POWER (POWER)
	1-696-593-11	CORD, CONNECTION (PAL) (1.5m COAXIAL CABLE WITH E-TYPE)
	3-709-299-01	COVER, BATTERY (V208)
	3-864-825-11	MANUAL, INSTRUCTION (ENGLISH)
	3-864-825-21	MANUAL, INSTRUCTION (ARABIC)(ME)
	3-864-826-11	CONNECTION, FITTING
	3-975-272-31	INDIVIDUAL CARTON (ML)
	3-975-272-41	INDIVIDUAL CARTON (ME)
*	3-975-273-02	CUSHION (UPPER)
*	3-975-274-01	CUSHION (LOWER)

****
HARDWARE LIST
****

#1	7-685-646-79	SCREW (3X8)
#2	7-621-775-10	SCREW +B 2.6X4
#3	7-628-254-15	SCREW +PS 2.6X6
#4	7-682-645-01	SCREW +PS 3X4
#5	7-624-106-04	STOP RING 3.0, TYPE -E
#6	7-685-645-79	SCREW +P 3X6 TYPE2 NON-SLIT
#7	7-682-147-01	SCREW +P 3X6
#8	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S
#9	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-921-698-11

Sony Corporation
Home A&V Products Company

98J1612-1D
Printed in Japan ©1998.10
Published by Quality Assurance Dept.
(Osaki East)